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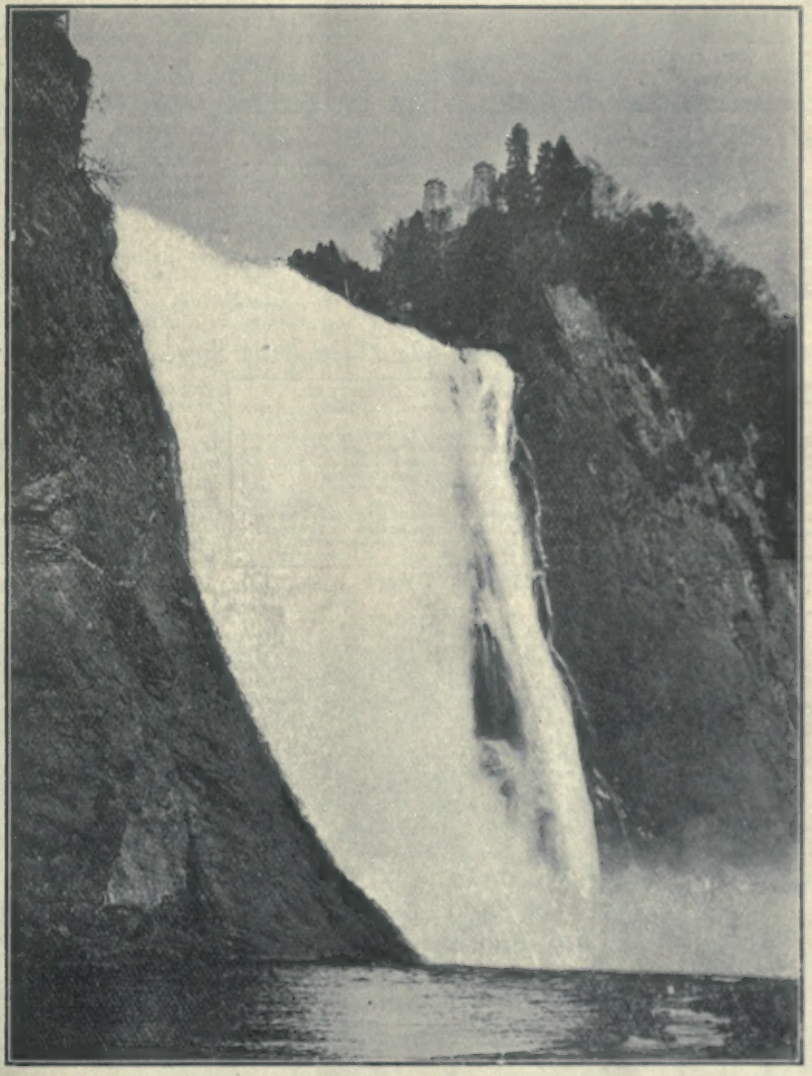

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Canadian Forestry Journal

VOL. VII OTTAWA, JAN.-FEB., 1911 No. 1

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Canadian Forestry Convention

Great Success Attends the Meeting at Quebec, Jan. 18 to 20, 1911

The deep interest taken by the Right Honorable Sir Wilfrid Laurier in the question of the preservation and perpetuation of the forests of the Dominion has been again shown by the very successful convention held in Quebec City on January 18, 19 and 20 last.

The convention was intended particularly for the French-speaking people, and a large proportion of the addresses and papers were in that

language. Prominent Canadian lumbermen and foresters, representatives of Dominion and provincial governments, railway officials, delegates from the United States Forest Service and the forestry interests of several states, and scientists whose work touched on forest problems presented their views on various forestry questions, while representative clergymen, Catholic and Protestant alike, expressed their good wishes for the success of the work.

Over four hundred persons signed the register of attendance, and fully one thousand persons were present at one session and another of the convention. The interest shown in the different papers and addresses was very marked.

Perhaps the outstanding feature of the many important phases of the convention was the evidence given of the awakened interest in forestry among Canadians of all classes. Though the discussions did not show that the representatives of the different interests — farmers, lumbermen, railway officials, navigators, administrators and others — were agreed upon what should be done, yet there was a general agreement upon the fact that the time had arrived when Canadians could no longer sit in a state of calm complaisance while their forests, with all they represented, were disappearing with woeful rapidity.

Worthy of special note, too, was the abundant hospitality of the men and women of the Ancient Capital, as shown especially in the splendid banquet given by the Premier and Legislative Council and the pleasant afternoon provided for the visitors by the Local Committee at Montmorency Falls after the labors of the convention had concluded.

The Opening Session.

The first session of the convention opened in the Legislative Council chamber, Parliament Buildings, at 10 a.m. on Wednesday, Jan. 18.

In the absence of the Honorary President of the Association, Sir Wilfrid Laurier, the president, Hon. W. C. Edwards, who occupied the chair, called on His Excellency the Governor-General to open the convention.

Earl Grey, speaking in French, addressed the convention as follows:—

Mr. President, Ladies and Gentlemen,—

Five years ago, at the request of the Prime Minister, Sir Wilfrid Laurier, I had the honor to open, in Ottawa, the first meeting of a convention assembled there for the purpose of studying the means of preserving what remained of our forests, so that they might be utilized for the requirements of the whole world.

A year later I was present at another similar convention in Vancouver. From that date the attention of the Canadian people has, in an ever increasing degree, concentrated itself on this question, which is of such high importance for the whole country. Forest fires have caused incalculable losses, which might have been prevented by more active vigilance.

But the interest taken to-day in the conservation of the resources of the country is at once enhanced and justified by the fact that those who have been, so to say, the apostles of the movement already find their zeal and energy rewarded and their efforts crowned with success. I am happy to see a number of them present on this occasion. They have understood that not only the welfare of a great industry but the wealth of our soil itself depends ou our forests. No efforts have been spared by them to secure adherents to their cause, by pointing out to them alike the magnitude of the dangers which menace this rich inheritance of ours and the means for its preservation.

I have already stated that I have been present at meetings of this association in Ottawa and Vancouver,

and I am happy to be in Quebec today, so that I may increase my knowledge of the steps which should be taken to have the forests of the mother-province of the Confederation become a source of increasing revenue to the Government and of prosperity to the whole country. I trust that your labors will have the result of convincing those who, from childhood, have looked upon the forest as the bitter enemy of agriculture that they must regard it hereafter as its friend and ally.

Parliament Buildings, Quebec, where the Sessions of the Forestry Convention were held.

Upon the conservation of our forests depend alike the regular flow of our navigable rivers and the fertility of our fields, and, consequently, the health and happiness of the nation.

Let us hope that from this convention, organized, as I have just stated, by Sir Wilfrid Laurier, will spring an influence which will realize the aspirations of us all.

It is a great pleasure to me to be present at so large a gathering, composed of representatives of every part of this immense Dominion. I extend a special welcome to Mr. J. G. Peters, of the Forest Service of the United States. His Government, with its customary generosity, has been kind enough to place Mr. Peters' services at our disposal, so that he may assist us with his advice in our efforts to exorcise the destroying element which has wrought such havoc in this country in the past. I am glad to take this opportunity of expressing my deep gratitude to the Government of the United States.

Gentlemen, I now declare this meeting open.

An official welcome was then extended to the delegates by Sir Lomer Gouin, Premier of the province of Quebec. After a few words of formal welcome, he thanked the convention for having selected Quebec as their meeting place, especially appropriate as the starting place of

colonization and the home of the storied 'coureurs du bois'. Most of all the provinces were the forests of importance to Quebec, not only for their effect on the waters, the fish and game they shelter, but for their beauty itself. Many of the steps advocated by Sir Wilfrid Laurier in 1906 had been adopted in Quebec, such as the establishment of forest reserves, the founding of a school of forestry, the improvement of the fire protective system, the inauguration of a forest survey and the introduction of a more modern system of selling the timber in place of the old leasing system. The great aim of legislation should be the accomplishment of some work for the permanent welfare of the nation and the good of posterity.

At the request of the chairman, Mr. Chouinard, Clerk of the City of Quebec, then read the following letter of regret from Sir Wilfrid Laurier:—

Dear Mr. Edwards,—

I am compelled, much against my will, to give up taking part in the Forestry Convention which opens to-morrow in Quebec. My parliamentary duties will not permit me to be away from Ottawa at the present moment. I would ask you to kindly convey to the members of the convention the expression of my deep and sincere regret. There is certainly no more important question for us, at this period of our national development, than that of the conservation of our forestry resources. I trust the Forestry Association will become a permanent institution and even if its first meetings produced no other result, a great progress would have been achieved.

Believe me, dear Mr. Edwards,
Yours very sincerely,
WILFRID LAURIER.

The Hon. W. C. Edwards,
Senator,
President Canadian Forestry
Association, Quebec.

The official welcome of the city of Quebec was then extended to the convention by the mayor, Mr. N. Drouin. He cordially welcomed the delegates as the city's guests and assured the Governor-General of their ardent loyalty to the British Crown.

His Grace Mgr. L. N. Begin, Archbishop of Quebec, was represented by Most Rev. P. E. Roy, coadjutor bishop. Mgr. Roy expressed the regret of Mgr. Begin at being unable to be present. Long ago, he reminded the convention, there had been a conflict between the settler and the forest, but of late the farmer was beginning to see that the forest was his friend. The clergy were disposed to do all in their power to aid the guardians of the forest. Laval University had lately opened a forest school, continuing thus to be a benefactor to the people. After paying a tribute to Mgr. Laflamme, Mgr. Roy assured the convention of the support of the clergy.

Right Rev. Dr. Hunter Dunn, Anglican Bishop of Quebec, also spoke briefly, expressing his good wishes for the success of the convention.

Mr. Jos. M. Tellier, leader of the Opposition in the Quebec Legislature, then spoke, expressing his good wishes to the convention and his sympathy with its work and welcomed the delegates to the city. Forestry was one question on which government and opposition were in cordial harmony. He suggested the separation of the forest work and that of colonization.

Short speeches were also made by the following:—Hon. A. L. Sifton, Premier of Alberta; Hon. Sydney Fisher, Dominion Minister of Agriculture; Dr. W. Peterson, Principal of McGill University; Dr. H. M. Tory, President of the University of Alberta; Prof. J. M. Briscoe, of the University of Maine; Mr. J. G. Peters, of the Forest Service of the United States; Dr. J. T. Rothrock,

of the State of Pennsylvania; Dr. C. C. Jones, Chancellor of the University of New Brunswick; Very Rev. Abbe Gosselin, of Laval University; Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick; Mr. Aubrey White, Deputy Minister of Lands and Forests for Ontario; Dr. Howard Murray, of Dalhousie University, Halifax, N.S.; Mr. A. S. Goodeve, M.P., of Rossland, B.C.; Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto; Mr. G. Y. Chown, Registrar of Queen's University, Kingston; Dr. W. J. Rutherford, Dean of the College of Agriculture of the University of Saskatchewan; Very Rev. Canon C. P. Choquette, representing the Bishop of Ste. Hyacinthe; Dr. E. H. Hall, Secretary of the Society for the Preservation of the Adirondacks; Mr. G. Willrich, U. S. Consul at Quebec; Mr. Harry I. Crowe, of Newfoundland; Mr. G. A. Vandry, President of the Quebec Chamber of Commerce; Mr. Jos. Picard, President of the Quebec branch of the Manufacturers Association, and Mr. R. H. Campbell, Dominion Superintendent of Forestry.

The convention then adjourned.

Wednesday Afternoon.

The convention resumed its session at two o'clock p.m., with Senator Edwards in the chair.

The first address of the afternoon was given by Hon. Clifford Sifton, Chairman of the Commission of Conservation, his subject being 'Forestry Problems and Forest Fires.' In introducing the subject, Mr. Sifton referred to the pioneers in the forestry movement and the difficulties they encountered, and to the opposition that met his own efforts, when Minister of the Interior, in establishing the Forestry Branch of that department. Mr. Sifton directed attention to the fact that the railways were the chief offenders in the starting of forest fires. During the past season the railways in Quebec had caused 75 fires out of a total of 171, in Ontario 404 out of 432, and on Dominion lands in the West 184 out of 1,227 fires. In British Columbia the total number of fires was 1,184, and of these the railways were known to have set out 272. He advocated making the penalties provided for the railways starting fires more severe, and bespoke the support of the convention for the Conservation Commission's work to this end.

Dr. E. H. Hall, secretary of the Society for the Protection of the Adirondacks, spoke of New York conditions. Finding that the railways were the chief offenders in the matter of starting fires in their forests, they had obliged them to use oil for fuel in their locomotives and to clean up their rights of way. These measures, together with the establishment of watch-towers, had almost freed the Adirondacks from forest fires.

FOREST ADMINISTRATION.

The topic of Forest Administration was introduced by Hon. Jules Allard, Minister of Lands and Forests of Quebec. He gave much statistical and historical information with regard to the forests of the province and their administration. He took occasion to emphasize the fact that in Quebec province the only timberlands privately owned were those included in the seignories and those patented by settlers. The present administration and regulation of the forested areas were also dealt with. Land classification, forestry education, fire protection and hydrographic exploration were also touched on by Mr. Allard.

Mr. R. H. Campbell, Dominion Superintendent of Forestry, then read his paper on 'Forest Administration.' He laid down, as the first essential for a forest policy, the necessity of setting aside definite areas to be permanently kept in forest. The second factor in forest policy was the establishment of a permanent, adequate and well-qualified force of men with theoreti-

cal and practical knowledge of forestry and administrative ability. The third factor was a sufficient and efficient patrol of the forests. He emphasized the need of protecting the young timber and concluded by summarizing the growth of the forestry work on Dominion lands since the first Dominion Forestry Convention in 1906.

Mr. Aubrey White, Deputy Minister of Lands and Forests for Ontario, representing Hon. Frank Cochrane, Minister of Lands, Forests and Mines for Ontario, spoke of Ontario's progress in forestry matters. He told how no township in New Ontario of which only fifty per cent. or less was suitable for agriculture was opened for settlement. The government had also decided on the policy of selling timber limits, not for the sole purpose of providing revenue for the province, but according to the needs of the time. Mr. White also told of the steps taken for the enlargement of Algonquin Park and referred to the measures taken for the improvement of the fire patrol scheme, and to the experiments in burning debris.

Hon. W. C. H. Grimmer spoke briefly on forest administration in New Brunswick, touching the questions of squatting on timberland, fires started by railways, the fire warden system, returns from cutting, etc.

The following gentlemen were appointed on the Committee on Resolutions: Hon. W. C. H. Grimmer, Hon. A. Bergevin, Hon. A. Sifton, Messrs. Aubrey White, H. M. Price, W. B. Snowball, G. Y. Chown, Alex. MacLaurin, J. F. MacKay, E. G. Joly de Lotbiniere and N. S. Dunlop and Lt.-Col. J. B. Miller.

The convention then adjourned.

Wednesday Evening.

On Wednesday evening the Premier and Legislative Council entertained at a banquet at the Chateau Frontenac, at which about 150 guests were present.

The Premier of the province, Sir Lomer Gouin, occupied the chair and acted as toastmaster. The toast to 'The King' was proposed by the chairman and honored in the customary way. Other toasts on the list were the following:—'Canada and Her Natural Resources,' proposed by Hon. C. R. Devlin and responded to by Hon. Clifford Sifton and Dr. H. Béland, M.P.; 'The Forestry Association,' introduced by Hon. L. A. Taschereau and Mr. J. M. Tellier, M. P.P., and replied to by Hon. Sydney Fisher, Hon. W. C. H. Grimmer, Mr. G. Y. Chown, Mr. Ferd. Van Bruyssel and others; 'Our Guests,' proposed by Hon. A. Bergevin, responded to by Dr. J. W. Robertson, Dr. Fernow, Dr. Rothrock, Mr. J. G. Peters, Hon. Clifford Robinson; and 'The Press,' which Hon. Mr. Allard proposed, Messrs. MacKay, of the Toronto Globe, and d'Hellencourt, of Le Soleil (Quebec), replying. Mr. Wm. Power, of Quebec, at the conclusion of the set toast list, proposed the health of the chairman, which was drunk with great enthusiasm.

The decorations of the banquetting hall were especially noteworthy. Small spruce and balsam trees had been so disposed as to form a veritable forest, in which figures of its animal inhabitants were placed in a very natural manner. At one end of the hall was a trapper's cabin. Altogether the decorations formed a most appropriate and inspiring setting for the sentiments of the guests and the object of the gathering. Needless to say, the cuisine was beyond criticism.

Thursday Morning.

The third session of the convention was opened at 10.30 on Thursday morning, with the president in the chair.

Letters of regret at inability to be present were read by the secretary from the following:—His Honor the Lieut.-Governor, Sir Louis Jetté, Administrator of the Province; Hon. Frank Oliver, Hon. Frank Cochrane,

Hon. A. K. Maclean, Hon. F. L. Haszard, R. L. Borden, M.P., D. McNicoll (vice-president of the C.P.R.), Wm. Little, Dr. Falconer (University of Toronto), Rev. Dr. Gordon (Queen's University), E. E. Ring (Forest Commissioner of Maine), and R. B. Bennett, of Calgary.

The first speaker was Hon. Sydney Fisher, who gave his address in French. He appealed to the Quebec government to undertake the work of reforestation in the province, there being large areas of land of little value except for forest growth. In addition to providing a supply of timber the water-powers would be safeguarded. He referred to damage to the forest arising from railway construction and to the care taken to safeguard this point in the building of the Transcontinental.

Mr. J. G. Peters, representing Mr. H. S. Graves, Forester of the United States, spoke with reference to the fire protection system on the U. S. National Forests. In speaking of the fires of the past summer (1910) he gave the following figures: Amount of loss, $25,000,000; territory burned over, 4,000,000 acres; amount of timber lost, 8,000,000,000 feet; cost of fire-fighting, $1,000,000. He spoke of the fire itself and the abnormally dry seasons that preceded it and in large part were accountable for its spread to such gigantic proportions. The administration was now trying to sell off as fast as possible the fire-damaged timber as the only way of utilizing it. As the requisites for a proper system of forest protection he gave the following: (1) A system of roads and trails; (2) Fire lines; (3) Lookout stations; (4) Telephone lines; (5) Rangers' cabins; (6) A full equipment of tools; (7) In some places, an equipment of pack trains; (8) An adequate force of patrolmen. He took up the features of the state forest laws in Louisiana, Maine, New York, Pennsylvania and New Jersey, and criticized the systems (or lack of system) of forest fire protection in other states. He also discussed the work of the private co-operative systems in the north-western states.

Hon. Achille Bergevin was the next speaker. He advocated the substitution of electric power for that of steam and suggested the building of a great national highway from coast to coast which would open up vast stores of water-power. As president of the Quebec Fish and Game Protective Association he gave special attention to the forests as game preserves.

Mr. W. C. J. Hall, Superintendent of the Forest Protection Branch of the Quebec Forest Service, read an able and important paper on Forest Protection. He detailed the measures necessary to secure adequate protection for the forests, including the creation of reserves on non-agricultural lands, the establishment of efficient patrols and lookout stations and proper supervision of railways, settlers, campers and others.

Mr. J. M. Briscoe, of the University of Maine, representing Hon. E. E. Ring, Forest Commissioner for the state, followed. After voicing the regret of Hon. Mr. Ring at being unable to be present at the meeting, he described minutely Maine's system of forest taxation, the methods of fire protection by lookout stations and patrol and the system of reports required of the patrolmen. He also gave statistics regarding forest fires for 1909 and 1910, and noted new legislation passed tending to better fire protection and co-operative measures arranged with the state of New Hampshire.

The meeting then adjourned.

Thursday Afternoon.

The first paper of the afternoon session was read by Hon. E. H. Bronson, of Ottawa, and was entitled 'Shall Canadians Conserve or Destroy Their Forests?' Mr. Bronson advocated the giving by the various governments to lumbermen of a

permanent tenure of their limits, and emphasized the importance of the classification of lands, so as to reduce illegitimate settlement, and the introduction of oil-burning locomotives to lessen the risk of fire from railways. Nature, he believed, if given the chance, would reproduce the forests satisfactorily.

Mr. N. S. Dunlop, Claims Agent for the C.P.R., represented Mr. D. McNicoll, vice-president of the railway. He pointed out the interest the railways had in preserving the forests and detailed the steps the railways were taking to prevent fires. Present regulations (which he outlined) went probably as far as legislation could reasonably go. Holders of property alongside railway rights of way were often to blame for fires starting, through leaving debris near the tracks. Many others—the lumbermen themselves, farmers burning brush, prospectors, campers and others — were to blame for many forest fires. His company spent thousands of dollars every year in putting out fires for which they were in no way responsible.

Mr. E. G. Joly de Lotbiniere followed with a paper bearing especially on the disposal of logging debris, the method he particularly favored being that of lopping the branches and leaving the debris on the forest floor.

The next paper was given by Mr. G. C. Piché, Chief Forestry Engineer of the Dept. of Lands and Forests, Quebec. He spoke of the extent, composition and value of the private forests of the province and those under license, following this by a short historical sketch of the Department of Lands and Forests from its establishment in 1852, and the various changes in organization up to the formation of the Forest Service and the reorganization of the department last year. The paper went on to describe the work of the department in the classification of land, supervision of cutting, etc., and treated also of the need of better sylvicultural methods, of the protection of the forests from fire,

Kent House, where the Delegates were Entertained by the Local Committee.

tree diseases, insect attack, wood preservation and testing, municipal forests and other topics.

In the absence of Mr. A. C. Flumerfelt, of Vancouver, B.C., who was detained by a snowslide in the mountains, Mr. A. S. Goodeve, M. P. for Rossland (a fellow-member of the B. C. Royal Commission on Timber and Forestry) gave a short paper on the forests and other natural resources of the province and outlined necessary steps to be taken for the protection and preservation of the provincial timberlands.

The paper of Mr. J. B. Whitman (Provincial Forest Ranger for Nova Scotia) was taken as read. It treated of the protection of the forests from fire under the subdivisions of (1) preventing fires, (2) extinguishing them, (3) investigating the causes, and (4) punishing the guilty persons.

Thursday Evening.

Thursday evening's session opened at eight o'clock. In the absence of the president, Mr. G. Y. Chown, vice-president, occupied the chair.

The first paper of the evening was given by Dr. C. C. Jones, Chancellor of the University of New Brunswick, on 'Forestry Education.' He urged making forestry education more intensive rather than more extensive, developing present schemes rather than creating new ones. Forestry literature should be distributed among farmers and the owners of small woodlots and the subject of forestry should be introduced into the public schools and taught through the medium of an elementary text-book of forestry.

Mr. Avila Bedard, of the School of Forestry of Laval University, read an account of 'The Progress of Forestry Education in the Province of Quebec.' The school at Quebec, Mr. Bedard claimed, was the first one planned in Canada, though the University of Toronto had been the first to carry out the plan of a forestry school. Mr. Bedard outlined the plan of instruction in the Laval school and gave interesting particulars of its present status. The government of the province was assisting the school in every possible way. Large lumber companies were also engaging forestry experts to manage their timberlands.

The chief feature of the evening's programme was the address by Dr. C. Gordon Hewitt, Dominion Entomologist, on 'Insect Enemies of the Forest.' Dr. Hewitt devoted by far the greater portion of his time to the spruce budworm and the larch sawfly, insects which have done and are doing so much to devastate Canada's forests. He outlined the life-history of each of the insects, and referred at length to the outbreak of the larch sawfly in England and the work done in developing destructive parasites to keep it in check. Similar work now in progress with reference to the spruce budworm was also described. The lecture was very well illustrated by stereopticon views.

Friday Morning.

At Friday morning's session the first paper was read by Mr. E. J. Zavitz, Forester to the Ontario Department of Agriculture, his subject being 'Waste Land Planting.' He referred particularly to the work being done in Norfolk county, Ontario, still largely in the experimental stage. From the nursery here forest planting material is forwarded, free of charge, to planters throughout the province. Mr. Zavitz contrasted Southwestern Ontario, with nine per cent. of its area in forest, with Prussia, where the forests cover twenty-five per cent. of the total area.

Mr. Arthur Amos then read a paper dealing with the water-powers of Quebec province. He gave some very surprising figures in regard to these. One river alone, the Manicouagan, had a million available horse-power. He also referred at length to the work of building dams at the

foot of Lakes Timiskaming and Kippewa with the object of regulating and keeping uniform the flow of water in the Ottawa river.

Mr. R. W. Brock, Director of the Geological Survey of Canada, then gave an address on 'Forestry and Mining.' A comparatively small amount of timber, he said, was used in Canada for mining; the metal mines, with an output of three million tons, use one and a half million feet, and the coal mines, with an output of eleven million tons, require about twelve and a half million feet. The estimated reserve of coal—172 billion tons—would require, perhaps, 172 billion feet of timber. Wood was also required in mining for fuel and the forests would also aid in the supply of waterpower which the mines needed.

Mr. Von Aueberg's paper, presented by Dr. Tory, was taken as read. It gave a short description of the forests of Alberta, and outlined a plan of administration and exploitation. Absolutely essential points, the writer considered, were the organization of a sufficient force of trained men, permanently employed, and the selling of forest products at a profit.

After some interesting remarks by Mr. G. Willrich, U. S. Consul at Quebec, on the pulpwood supply of the province, the report of the Committee on Resolutions was presented by the chairman, Hon. W. C. H. Grimmer, and, after some discussion, adopted. It will be found elsewhere in this issue.

The chairman then declared the meeting adjourned.

Friday Afternoon.

On Friday afternoon the local committee tendered the visitors a reception at the Kent House, Montmorency Falls. Leaving the city at 2.30, a merry crowd proceeded by the Quebec Railway Light and Power Co.'s cars to the Falls.

On arrival at the Kent House the guests were graciously welcomed by Madame E. G. Joly de Lotbiniere, assisted by Mesdames McLimont and Panet and other ladies. Varied amusements were provided for the guests, including dancing in the ballroom and coasting on the slides outside. Dainty refreshments were also served.

[Photo G. H. Edgecombe, Oct., 1910.

Spruce on the Livingstone River.

Note the bare south exposure on the mountain on the left, while the north exposure, facing it, is covered with a heavy growth of lodgepole pine and spruce, of pole size. In the foreground is open grazing land, covered with bunch-grass, wild pea and annual herbs and grasses. Altitude of grazing land about 4,400 feet above sea-level.

Determining the Boundaries.

Work of Dominion Forest Service on East Slope of Rockies.

By G. H. Edgecombe, B.Sc., B.S.F.

During the past summer two parties were employed by the Dominion government in determining the eastern boundary of the Rocky Mountain forest reserve. One party worked north from the Sarcee Reserve (Township XXII, Range IV, west of the fifth Dominion meridian) to the 11th base line, the other south to the International Boundary.

The type of tree growth of the Eastern Slope is spruce-pine-poplar, most likely determined by the soil moisture—the spruce on the fresh to moist loams, the pine (jack or lodgepole) on dry sandy soils, chiefly on north exposures, the poplar coming in under all conditions, but chiefly on south exposures. From the Highwood river south, Douglas fir occurred in groves and scattered on

[Photo G. H. Edgecombe, Sept., 1910.

East side of Victoria Peak, showing scattered tree growth towards timber line. Altitude about 5,600 feet above sea-level.

The work of the southern party partook of the nature of a reconnaisance survey, but was in reality a determination of woodland and non-agricultural land from the agricultural and also the true grazing land.

Beside the growth type, the topography and the nature of the soil, the community (e.g., along the Crow's Nest Railway) was a considerable factor in the determination.

south exposures. Willow was found on the lower slopes. Larch (larix occidentalis) was of scrubby growth, maintaining soil cover on the rocky upper heights, as, for instance, on Table Mountain, at 6,000 ft. altitude and upwards.

Along the reserve boundary the topography varies from moderate slopes (eight to twenty degrees) in the north to the steep (twenty to forty-five degrees) and often bare

rocky exposures characteristic in the south towards the International boundary. The altitude is 4,300 feet and upward.

The nature of the soil varied from sandy loam in the valleys to the thin stony soils with rocky exposures of the higher slopes. Repeated fires have in many cases led to the erosion of the rocky hillsides, leaving solid, bare rock-beds of sandstone or dolomite.

The community along the line, although not large nor gregarious, except along the railway, was often found in the most unexpected places, where under the present system of survey a quarter section may offer only twenty to forty acres of ploughable land, the land being held for grazing only. It may be added that in the neighborhood of the reserve a quarter section is insufficient to maintain a settler.

If one has visited the Eastern slope, he must feel impressed by the many evidences of devastation by fires. Of the one hundred and thirty to one hundred and forty miles run due south along the boundary, mature virgin timber was encountered only in a small tract of some twelve consecutive square miles, the dry standing sticks, windfalls and rocky exposures or barrens telling the tale. Even this summer, by incendiarism and by the carelessness of fishermen, prospectors and surveyors, the fire was allowed to run over many townships, and to bring these back to their former condition will require — even if one takes the most optimistic view — for the pine, sixty years to produce eight-inch props and ninety years or more for twelve-inch timber.

The provision of the future supply of lumber, posts, etc., for the prairie provinces and of mine props and timber for the rich and yet unopened and even unknown coal mines of the mountains must be a primary consideration in the management of this reserve. The effect on the water-flow of the streams, and so on irrigation, is most important and the furnishing of hunting grounds for the sportsmen and of recreation grounds for holiday and rest seekers is no small part of their value. It should be the effort of everyone connected, in however remote a way, with the reserve to hand it down to the coming generations not only unimpaired but even improved. If this is to be done an indispensable necessity is a most thorough and intensive fire protective system for the region.

The Annual Business Meeting.

The twelfth annual business meeting of the Canadian Forestry Association was held on February 7th, at eleven o'clock, in the Council Chamber of the City Hall, Ottawa.

The chair was occupied by the president of the association, Hon. W. C. Edwards, and among those present were Messrs. Hiram Robinson, R. H. Campbell, Denis Murphy, G. H. Edgecombe, J. R. Dickson, H. Cheney, D. E. Clark, E. M. Wilkinson, R. Patching and R. Martin, Ottawa; H. M. Price, Quebec, P.Q.; Alex. MacLaurin, Montreal, P.Q.; Lt.-Col. J. W. Harkom, Melbourne, P.Q.; F. R. Haney, C.P.R., Montreal, P.Q.; John Hendry, Hugh Matier, Vancouver, B.C.

The report of the directors, given in full elsewhere in this issue, was received and adopted. The Treasurer's report was also received and approved.

Communications were read from Messrs. J. B. Miller, Toronto; N. S. Dunlop, Montreal; Thos. Southworth, Toronto; Wm. Little, Mont-

real; Wm. Pearce, Calgary; F. C. Whitman, Annapolis Royal, N.S.; A. Bedard, Quebec, P.Q.; F. Hawkins, Ottawa; H. E. Channell, of Sherbrooke, P.Q., and the secretary of the Canadian Society of Forest Engineers.

The report of the Committee on Fire Laws, summarized in another column, was read and ordered to be received and laid on the table.

It was decided to increase the number of directors to thirty, and the following were added to the Board of Directors: Mgr. O. E. Mathieu, Dean of the Faculty of Arts of Laval University, (vice the late Mgr. Laflamme); Messrs. Wm. Pearce, Calgary, Alta.; Wm. Power, Quebec, P.Q.; J. Hendry, Vancouver, B.C.; D. Murphy, Ottawa, Ont.; C. Jackson Booth, Ottawa, Ont.; Wm. Price, Quebec, P.Q.; Lt.-Col. J. W. Harkom, Melbourne, P.Q.; C. E. E. Ussher, Montreal, P.Q.

Votes of thanks were passed to those of the provincial governments and of the banks who had assisted in the work of the association.

The matter of the place for the next meeting was discussed, Winnipeg being the place generally favored, but the matter was finally left in the hands of the executive.

The auditors and the editorial committee were re-appointed.

On the order for election of officers being called, it was moved by H. Robinson, seconded by A. MacLaurin, that the vice-president, Geo. Y. Chown, Registrar and Treasurer of Queen's University, Kingston, Ont., be elected president for 1911, and the motion was unanimously carried. On motion of D. Murphy, seconded by H. Robinson, Mr. J. Hendry was elected vice-president for the year.

The other officers were re-elected.

The meeting then adjourned.

At a meeting of the directors held immediately at the conclusion of the meeting of the association, the territorial vice-presidents were reappointed for the year, with the exception of Alberta, where Hon. Arthur L. Sifton, Premier of the province, replaces Mr. Wm. Pearce, who is elected to the board of directors.

TREASURER'S REPORT.

M. Robinson, Treasurer, in Account with the Canadian Forestry Association.

Receipts.

1910—Balance from 1909	$2,561 10
Membership fees	2,254 50
Copies of Forestry Journal	7 50
Advertising in Forestry Journal	31 00
Grant from Quebec Govt.	200 00
Grant from Ontario Govt.	300 00
Subscription from Trader's Bank	50 00
Balance due from R. L. Campbell	11 55
Lantern slides	1 85
Interest	80 85
	$5,498 35

Expenditure.

1910—Salaries	$1,900 00
Typewriting and other clerical work	94 09
Travelling expenses of Secretary	400 00
Printing Forestry Journal	870 22
Misc. printing, supplies, etc.	405 03
Reporting annual meeting	62 80
Printing annual report	391 42
Translating "	75 00
Quebec Convention	200 00
Lantern expenses	147 96
Commission on cheques	8 16
Balance	1,933 67
	$5,498 35

Ottawa, Ont.,
Feb. 6, 1911.

Audited and found correct.
(Sgd.) FRANK HAWKINS,
H. CLENDINNEN,
Auditors.

Directors' Report for 1910.

Progress of Forestry and the Forestry Association.

The Board of Directors beg to submit the following report of business done during the past year:—

According to Section VI. of the Constitution, the following Territorial Vice-Presidents were appointed:

Ontario—Hon. Frank Cochrane.
Quebec—Hon. Jules Allard.
New Brunswick—Hon. W. C. H. Grimmer.
Nova Scotia—Hon. A. K. Maclean.
Prince Edward Island—A. B. Warburton, M.P.
Manitoba—Hon. R. P. Roblin.
British Columbia—Hon. H. Bostock.
Yukon—Commissioner Henderson.
Saskatchewan—His Honor A. E. Forget.
Alberta—Wm. Pearce.
McKenzie—F. D. Wilson.
Keewatin—His Honour, Sir Daniel H. McMillan.
Ungava—His Grace, Mgr. Bruchesi, Archbishop of Montreal.

Conventions. — The great event of the year has been the Dominion Forestry Convention, convoked by the Right Hon. Sir Wilfrid Laurier, which met in the City of Quebec, Jan. 18-20. At the request of the Premier the Association arranged the details of the organization of this meeting, which through the kindness of the Government of Quebec was held in the Legislative Council Chamber of the Parliament Buildings. The meeting was opened by His Excellency the Governor General; the President, Hon. W. C. Edwards, occupied the chair during the three days' session, Sir Wilfrid Laurier, who hoped to preside, at least during the opening day, being prevented at the last moment by important state business from taking part. The meeting being held immediately after and in conjunction with the annual meeting of the Commission of Conservation had the advantage of the presence of the members of that body, nearly all of whom, including Hon. Clifford Sifton (Chairman) and Hon. Sydney Fisher, took part in the programme of the Convention. There was a large attendance from all parts of Canada, especially from the Province of Quebec, and from Newfoundland and the United States. Sir Lomer Gouin, Premier; and Hon. Jules Allard, Minister of Lands & Mines, took a personal interest in the meeting. The local committee also contributed very much to the success of the gathering. Over four hundred persons signed the record of attendance.

Progress in Canada. — Your Directors are pleased to be able to report that the work which the Association and similar bodies have been doing for some years is beginning to show results in increased interest in all parts of Canada. They feel that the efforts of the members of the Association are being at last rewarded and that attention is now being turned to the matter of conserving the forests. The work of the Forestry Branch of the Department of the Interior, under the direction of Mr. R. H. Campbell, Dominion Superintendent of Forestry, is steadily progressing. The fire patrol force is being systematically increased. During the past summer the Branch had two parties in the field locating the boundaries of the Rocky Mountains Forest Reserve; two other parties made exploratory trips along the proposed route of the Hudson Bay Railway in order to ascertain the quantity of timber available; other parties were at work classifying lands in British Columbia.

A new bill to extend the Dominion forest reserves is now before Parliament.

In Quebec the year has been made specially memorable by the stablishment of a school of forestry affiliated with Laval University, which commenced its sessions in September last with an attendance of ten pupils. The forestry work of the Department of Lands and Forests is also making steady and substantial progress.

Ontario is also taking forward steps in regard to her forests. Most noteworthy of these is the inauguration of experiments in connection with the burning of brush at the time of cutting. Also worthy of notice is the policy of treating Algonquin Park as a "fur farm," restricting the increase of the beaver each year and making a revenue from the sale of the skins of captured animals,—a policy similar to that adopted in the German forests. Steps have also been taken looking toward the extension of the park and to the extinguishment of certain old cutting rights therein. Progress has also been made in the planting of waste sand lands of the province.

In British Columbia the force of fire rangers has been increased with good effect. The Royal Commission on Timber and Forestry appointed by the Government of British Columbia has completed its work and published its report. Papers explanatory of the work of the Commission were given at the Quebec Convention by Messrs. A. S. Goodeve, M.P., and A. C. Flumerfelt, and will appear in the report of that convention.

The field work of the Nova Scotia forest survey has been completed and the report on the survey is now in preparation.

Publications. — At the last annual meeting resolutions were passed instructing the Secretary to secure all possible information regarding the publication of the Canadian Forestry Journal monthly or bi-monthly, and especially what increased revenue might be had from advertising. A number of advertising agencies were approached, but none of them would undertake the work of securing advertising for the Journal. Upon the advice of experienced advertising men it was decided that the Secretary should himself endeavor to get more advertising. This had only just begun when the pressure of work for the Quebec Convention caused it to be put aside, but some new advertising has been secured and the prospects seem to be good for development. As the contract for publishing the Journal had expired, tenders were called for from a number of printers in Toronto, Ottawa and Quebec, and after careful consideration the contract was awarded to the Ottawa Printing Company. This new contract and the new form of the Journal render it easier to bring out the Journal more frequently, but it is felt that for 1911 the issues should not be more frequent than one in two months, which will enable the possibility of monthly publication to be more readily estimated.

Arrangements for issuing bulletins are now more complete and it is hoped to develop this side during 1911.

Of the annual report of 1910, 3,500 copies in English and 3,000 copies in French have been issued.

Branch Associations. — The Secretary consulted several organizations but cannot as yet report any plan for branch provincial associations. The American Forestry Association has been unable to solve this question, and in the United States many states have forestry associations meeting independently of the federal association. It is hoped that some way may be found to prevent this overlapping in Canada.

Work of the Officers. — As soon as the last annual meeting was over the Secretary returned to Western Ontario and delivered a number of lectures on forestry. He visited the camp of the Faculty of Forestry of Toronto University, at Nine Mile Lake, Muskoka, and noted the methods of work there in training students for conducting woods operations. He secured a number of photographs for use in his lectures. In midsummer he visited the United States and consulted with officers of the American Forestry Association and the United States Forest Service at Washington and the Secretary of the Pennsylvania Forestry Association in Philadelphia. He then spent two weeks at Milford, Pennsylvania, where the students of the Yale Forest School carry on their woods work. Upon returning to Canada he moved to Ottawa as it was felt he could better carry on the work of the Association from this point. He has been here granted office room in the Forestry Branch, and is thus in close touch with the Assistant Secretary and Treasurer. This saves a large amount of correspondence and makes the work more efficient.

The Assistant Secretary has been chiefly occupied with the publication side of the work. This is now on a better basis both as regards the magazine and the bulletins than ever before. Mr. Jacombe was also of great help to the Secretary at the Quebec Convention, and assisted him in the details of the office work which was heavier this year than in the past.

The Treasurer, Miss Robinson, has rendered the same efficient, painstaking service as in past years. Her methodical arrangements and her careful scrutiny of the accounts ensure, along with the other safeguards, that the funds of the Association are carefully kept, and are expended only under proper authority.

Membership and Funds. — The total receipts for the year including a balance of $2,561.10 from 1909 were $5,498.35, of which $2,254.50 was from members' fees. The expenditures were $4,464.68, leaving a balance of $1,033.67. While this seems somewhat large it must be remembered that with the enlarged scope of the work larger expenditures will be required. The details of this income and expenditure will be found in the Treasurer's statement. The Dominion Government has continued its grant of $2,000 and there have also been received $300 from the Government of Ontario, and from Quebec $200. It is expected that for 1911 these will be received and also $100 each from New Brunswick and British Columbia. As in the past leading banks of Canada have aided the Association by making their branch managers and other officials mem-

(Continued on Page 28.)

Report of Resolutions Committee.

Adopted at the Canadian Forestry Convention at Quebec, January 18th to 20th, 1911.

Hon. W. C. H. Grimmer, Chairman of the Committee on Resolutions, reported as follows:—

The Committee on Resolutions having considered the several matters submitted to them, beg leave to submit the following resolutions for the consideration of the Convention:

1. *Resolved*, that this Convention desires to place on record its appreciation of the interest shown by His Excellency Earl Grey in the work of the Canadian Forestry Association, and of his attendance at its meetings.

2. *Resolved*, that this Convention desires to place on record the deep sense of gratitude it is under to the Right Honourable Sir Wilfrid Laurier for his action in calling this meeting, and for the widespread interest he has aroused throughout Canada by his general invitation to all representative bodies and citizens to take part therein.

3. *Resolved*, that this Convention desires to express its regret at the illness which prevented His Honour the Lieut.-Governor from assisting at this meeting and expresses the hope that he may soon be restored to health.

4. *Resolved*, that this Convention desires to record the great loss sustained by Canada and the Province of Quebec in particular, by the death of one of its most esteemed and valued members, Monsignor Laflamme, who, through his devotion and untiring efforts to promote the objects and aims of the Canadian Forestry Association, earned the gratitude and admiration of all those having the welfare of the Dominion at heart.

5. *Whereas*, it is a matter of notoriety that the loss of a large proportion of our forest wealth is due to the fires set by locomotives passing through our wooded areas, and whereas the Dominion "Railway Act," R.S.C., Cap. 37, Section 298, provides as follows:—

> "Whenever damage is caused to crops, lands, fences, plantations, or buildings and their contents, by a fire, started by a railway locomotive, the company making use of such locomotive, whether guilty of negligence or not, shall be liable for such damage and may be sued for the recovery of the amount of such damage in any court of competent jurisdiction; Provided, that if it be shown that the company has used modern and efficient appliances and has not otherwise been guilty of any negligence, the total amount of compensation recoverable in respect of any one or more claims for damage from a fire or fires started by the same locomotive and upon the same occasion, shall not exceed five thousand dollars.
>
> "(2) The compensation, in case the total amount recovered therefore is less than the claims established shall be apportioned amongst the parties who suffered the loss as the court or judge may determine."

Therefore Resolved, that with the sole idea and motive of compelling the Railway Companies to exercise great care in the operation of their lines through wooded areas, it is advisable in the interest of our public forests, and other wooded areas, that the said section 298 be amended so as to leave the Railways responsible for all damages that may occur through fires set by their locomotives.

6. *Resolved*, that this Convention wishes to place on record its heartfelt satisfaction at the great advance in the appreciation of forest preservation throughout the Dominion, and recommends that in all forest lands controlled either by the Dominion or by the Provinces there should be a more systematic development of forest protection by educated forest inspectors, fire rangers, fire lines, fire roads, telephone lines, etc., etc., and that as the value of the forests has increased there should be more adequate amounts spent for protection.

7. *Resolved*, that this Convention approves of the legislation introduced by the Dominion Government for the setting aside of a forest reserve on the eastern slope of the Rocky Mountains for the purpose of protecting the forests and the water supply, and would strongly recommend a sufficient appropriation by Parliament for its proper supervision and development.

8. *Resolved*, that it is expedient in the public interest that the Provincial Governments should consider the question of controlling fires set out for the clearing of lands adjoining forests, and should promote such legislation as will prevent the same spreading into the neighboring for-

ests, thus also protecting the settlers and their property.

9. *Resolved*, that this Convention approves of the action of the Governments of Ontario, Quebec and British Columbia in requiring that timber cut on Crown lands be manufactured in Canada, and would be pleased to see the other Provinces follow their example.

10. *Whereas*, the forests of Canada are a great national asset, and, whereas the welfare of our agriculture, health and climatic conditions, as well as the national prosperity of the country depend upon the proper and scientific care of the forest areas.

Therefore Resolved, that this Convention commends the action of the Province of Quebec in employing technically trained Foresters in its service, and recommends to the other Provinces of Canada the importance of this policy.

11. *Resolved*, that in the opinion of this Convention the establishment of fish hatcheries in the Province of Quebec is important, and that the teaching of pisciculture should be a part of the curriculum of the Forest School of Quebec.

12. *Whereas*, roads and highways are great factors in the development and protection of our forests and means of improving transportation all through the country.

Therefore Resolved, that this Convention thinks it highly desirable that a national highway should be built from the Atlantic to the Pacific, also recommends to the Provincial Governments the increasing of their subsidies for the building of new roads and the improving of existing highways, and expresses the opinion that the counties and municipalities of the Dominion should encourage more efficiently the improvement of roads within their limits.

13. *Resolved*, that this Convention desires to place on record its appreciation of the kindness of the Premier, Sir Lomer Gouin, and the members of the Government and Legislature of Quebec, especially Hon. Jules Allard, Minister of Lands and Forests, for the many kindnesses and hospitality shown the members at this meeting.

14. *Resolved*, that the thanks of this Convention be extended to Hon. A. Turgeon, President, and to the members of the Legislative Council of Quebec, for their kindness in placing their magnificent Chamber at the disposal of the Convention for its sessions.

15. *Resolved*, that this meeting desires to express its appreciation of the heartiness and unanimity with which His Worship the Mayor and the citizens of the City of Quebec have welcomed the members of this Convention and have assisted in rendering their visit one of pleasure as well as profit.

16. *Whereas*, in a country of great distances like Canada the success of such a Convention as this depends to a large extent upon the Press and the Railways.

Therefore Resolved, that this Convention desires to place on record its appreciation of the kindness of these two agencies in aiding its efforts.

A NEW FOREST FIRE BULLETIN.

'Of all the civilized nations in the northern hemisphere, Canada is doing the least to treat the public timber-lands as a permanent asset.'

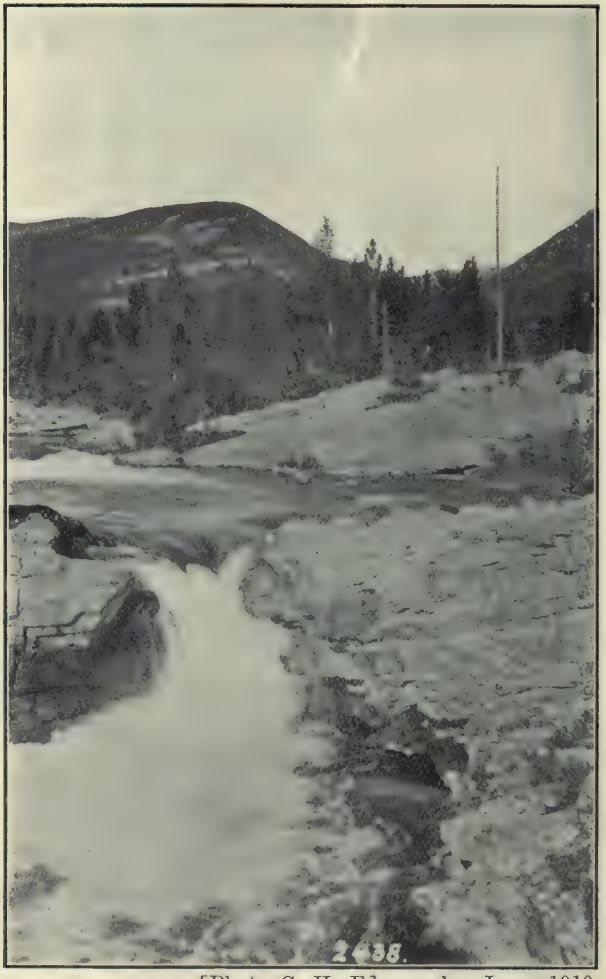
This is the conclusion reached by Mr. H R. MacMillan, of the Dominion Forest Service, after a study of the present status of forestry in Canada, particularly in regard to the forest fire problem. This study is published by the Forestry Branch of the Department of the Interior as their Bulletin No. 9 ('Forest Fires in Canada').

During 1909 the loss through forest fires throughout Canada amounted to $210,400, and 1909 was by no means a bad year for fires. The expense of fire fighting and fire protection amounted to $330,000.

There can be little doubt that this total of fire loss is much too small. In the first place, the value of the timber destroyed is arbitrarily placed at $1 per thousand feet, board measure, while the actual value of the trees as they stand in the forest would average much higher than this. No account is taken of the damage done to young growth, which, while not now actually saleable, will in the course of a few years have considerable value. 'An enormous amount of cordwood,' to quote the words of the writer, 'destroyed, in districts where it now has a value, and in other districts where it will soon be needed, has neither been estimated nor valued.' Many fires have undoubtedly occurred in districts remote from present settlement, and have destroyed large quantities of timber which ultimately would command a ready market.

Extracts are given from many works dealing with exploration in Canada to show how widespread and disastrous have been the fires in former years — even before exploration was attempted, in many cases.

Treating the subject more generally in the first part of the bulletin, Mr. MacMillan arrives at the conclusion that seven



[Photo G. H. Edgecombe, June, 1910.

Falls on Elbow River.

It is from this fall that the City of Calgary proposes to develop power. Note the limestone formation; once burned over, it will remain bare for an indefinite period.

times as much timber has been destroyed by fire in Canada as has ever been cut by lumbermen. This view is sustained by many lumbermen, some of whose estimates exceed even this.

The treatment of land cut or lumbered over and destined to remain permanently in forest is one of the big problems of forestry on this continent. This is also discussed, and plans are outlined for the cutting of the timber so as to reduce as much as possible the danger from fire. Of all kinds of land, cut-over timberland, with chips, tree-tops and other debris scattered around, presents the greatest danger from fire—a fact that is emphasized by many fires which occurred even during the past summer in British Columbia and western Ontario.

Any who care to look further into this subject may obtain copies of the bulletin mentioned above, free of charge, on application to R. H. Campbell, Superintendent of Forestry, Ottawa.

Forest Fire Legislation

A Synopsis of the Report of the Committee of the Association

At the annual business meeting of the Canadian Forestry Association held in March, 1910, a committee consisting of Dr. B. E. Fernow and Messrs. W. C. J. Hall, Thos. Southworth, Dr. Judson F. Clark, G. C. Piché, F. Davison and Ellwood Wilson was appointed to investigate the laws of the Dominion and the various provinces concerning the protection of the forests from fire, and to point out defects in these and suggest remedies. The report of this committee was presented to the Canadian Forestry Convention in Quebec in January last, and also to the annual business meeting of the Canadian Forestry Association, and will be published in full in the report of the Convention. Consequently only a synopsis of the report is given here. This synopsis is as follows:—

A brief analysis of the different laws existing in each province shows great variety of method.

It is pointed out that, while the objects and main features or principles might be made more alike, the methods of application must vary with different conditions. The forest fire law of Nova Scotia is declared the best and most efficient, designed for a well-settled country, but would be only partially applicable in other provinces.

The essentials of proper fire legislation are discussed in detail, and it is pointed out that proper organization of a protective service is more essential than legislation, that the legislation should not be specific but allow wide latitude in making rules and devising methods to the head of the fire service, who with all his assistants, inspectors and fire wardens — a permanent organization — should be made responsible for the safety of the districts in which the country should be subdivided.

The construction of watch towers equipped with necessary apparatus, and the building of trails and telephone lines, while not inexpensive, are essential to complete success, and a supreme effort should be made, even if expensive, to stop the evil. The prompt discovery of fires and the prevention of their getting beyond control would be thereby attained.

A main need is to change the attitude of the people at large. Hence an educational campaign by the fire service organization should go on at the same time with their exercise of police functions.

The burning of brush and 'downing' of tops by lumbermen, not under a general prescription, but by rule in each case, is advocated.

The responsibility and methods of fire prevention by railroads are discussed at length upon the basis of an exhaustive report by the New York State Public Service Commission.

The possibility of oil-burning locomotives is hinted at. The making of broad fire safety strips is condemned, and instead a forest-covered strip, to exclude sun and wind, cleaned of easily inflammable material, is recommended. A regular bicycle fire patrol to follow each train is suggested, and it is pointed out that since the danger of fires spreading is confined to the hours of 9 a.m. to 5 p.m. the expense could probably be kept quite low. The inefficiency of spark-arresters and ashpans is explained.

The work of forest protection associations in the Western States is discussed, and the effectiveness of such associations shown.

The report concludes with the statement of belief that the people are ready for a supreme effort to get rid of the fire evil which threatens to wipe out a large portion of the natural resources of the Dominion, not only in timber, but in soil, thousands of square miles of which are now burned into barrens.

One of the latest uses of cement as a substitute for wood is in shipbuilding. A scow constructed of reinforced concrete was successfully launched at Port Dalhousie, Ont., on Nov. 9 last. .It is designed for general use in maintenance work on the Welland canal.

Hon. Frank Cochrane, Minister of Lands, Forests and Mines for Ontario, recently announced that during the coming winter experiments in burning slash would be conducted on certain timber limits in Rainy River district.

L'histoire de l'administration des forêts dans la Province de Québec.

(Partie du travail de M. G. C. Piché lu à la Convention Forestière Canadienne de Québec.)

Maintenant que j'ai exposé sommairement les conditions actuelles de nos domaines boisés, il importe de discuter notre administration forestière et de parler du service forestier.

En 1852 fut créé le Département des Terres et Forêts pour s'occuper de l'administration des terres et forêts des deux Canadas, car la province de Québec et celle d'Ontario étaient alors réunies et devaient rester ainsi jusqu'en 1867. En même temps on organisa diverses agences sur différents points du pays pour s'occuper des ventes locales de lots et de la surveillance des coupes. Avant cette date, les transactions se faisaient par les bureaux d'Ottawa et de Québec. En 1867, notre province reprit le contrôle de ses forêts et le nouveau département des Terres et Forêts s'occupait de faire valoir nos ressources. Si l'on en juge par un arrêté en conseil, en date de 1869, les conditions d'alors étaient bien pitoyables, cent fois ce dont on se plaint aujourd'hui. Cet ordre en conseil confiait à M. de Salaberry le soin de s'occuper, de protéger les forêts contre les maraudeurs, d'arrêter le pillage qui se commettait sur une grande échelle en certaines localités, l'empiètement de certains exploitants sur le domaine de la Couronne avoisinant leurs limites, et enfin de protéger la forêt contre les ravages de l'incendie qui détruit dix fois plus que ne peut le faire la hache de l'exploitant ou du défricheur. Cet agent-forestier, bien que recevant $1,400.00 par an et ses frais de déplacement, ne semble pas avoir fait grand bruit, et ses attributions bien que vastes auraient plutôt un caractère administratif, car les rapports annuels du département sont muets sur ses agissements et les maux dont on se plaignait avant sa nomination, continuèrent de sévir et de s'accroître. En 1873, on lui nomma cependant un assistant, M. Louis Gosselin, avec le titre de garde-forestier, au salaire de $1,200.00, mais ses exploits ne sont pas non plus parvenus jusqu'à nous. Ces deux officiers ne figurent plus sur la liste des employés du département des Forêts après 1874.

Jusqu'à 1873, date de la création du premier corps de gardes-forestiers, la surveillance forestière aurait été faite par les agents locaux. On s'en rapportait donc exclusivement aux rapports que transmettaient les licenciés en conformité avec la loi de 1849 qui les obligent à produire à l'expiration de leurs licences, au 30 avril, un état assermenté de leurs opérations forestières. Ils transmettent ces rapports également de nos jours, mais à la date du 30 juin seulement. Cependant, était donné qu'il se faisait alors beaucoup de bois carré, les rapports étaient justifiés en partie par les mesurages du bois carré par le bureau des mesureurs de Québec créé en 1842 et qui subsiste encore de nos jours; pour les autres bois on n'avait aucun contrôle et c'est là un des vices de l'ancienne administration forestière. Ce n'est qu'en 1888 que fut organisé le bureau des examinateurs de mesureurs de bois de la province de Québec.

Donc, en 1873, on créa un corps de gardes-forestiers, qui furent employés à la surveillance forestière, sous la direction des agents et du département. Le rapport annuel du ministère indique qu'il y avait, en 1873, 28 gardes-forestiers et que ce service avait coûté $3,013.27. L'année suivante, 40 gardes-forestiers sont employés ce qui porte le coût de la surveillance à $9,501.20. On peut se rendre compte des vols de bois qui se commettaient alors, car le chiffre des pénalités recueillies par le département en 1872-73 n'était que de $3,186, mais l'année suivante les gardes-forestiers percevaient $32,906. C'était un magnifique résultat pour un début, et l'on aurait dû développer ce système de surveillance, créer une direction; mais non, les gardes se trouvent distribués deux ou trois, par agence, travaillant sans direction efficace, d'une façon intermittente, de sorte que ces braves gens perdaient toute ambition dans une carrière aussi ingrate.

Dix ans après, en 1883, le personnel employé comprend 46 personnes et coûte $13,598.00. L'année suivante, 1884, les gardes-forestiers sont employés à faire quelques inspections de lots, pour en déterminer la valeur agricole. C'est le commencement du fameux travail de classification des sols; jusque là la vente des lots s'était faite d'après les rapports des arpenteurs et de quelques employés spéciaux, comme M. Bureau.

Ce n'est qu'en 1889, que l'on donne des chefs autorisés à ces gardes forestiers. Ces chefs reçurent le titre de surintendants des gardes-forestiers. On en nomma sept et je tiens à vous les nommer avec leurs territoires respectifs. M. Charleson, qui s'occupait des agences de l'Ottawa; M. Reynar avait le contrôle des opérations dans l'agence St-Charles et sur le Saint-Maurice; M. Nagle travaillait dans les districts de St François et Arthabaska; M. Pozer avait la surveillance des agences de la Chaudière, de Montmagny et de Granville; tandis que le Dr Crépault s'occupait des comtés de Rimouski, Bonaventure et Gaspé. MM. Latour et Audet se partageaient la surveillance forestière dans le lac St-Jean et le Saguenay.

Le personnel fut augmenté et porté à 78 gardes-forestiers. J'ai eu occasion de lire les instructions, les rapports de quelques-uns de ces officiers et j'étais surpris de voir combien ils réalisaient l'importance de leurs fonctions. Le service coûta bien cher naturellement: $50,172 en 1890, mais les statistiques du département indiquent d'autre part un accroissement de revenu considérable; ainsi, en 1887, on avait perçu $447,200 de droits de coupe, en 1888, $707,257, en 1889, $626,653, etc. Ces chiffres sont éloquents et démontrent que les rapports d'opérations fournis alors au département n'étaient peut-être pas toujours des plus complets.

En 1892, M. Charleson fut destitué et les autres chefs perdirent leur emploi de surintendant. Les gardes-forestiers travaillèrent, comme avant, sous la direction des agents.

En 1897, M. J. C. Langelier fut nommé surintendant des gardes-forestiers, position qu'il occupa jusqu'à sa mort, survenue au mois de mai dernier. Il tenta de réorganiser le service, mais comme les gardes-forestiers étaient dans un grand nombre de cas incompétents, que leur position était précaire par le fait qu'on ne pouvait les employer qu'une partie de l'année, il ne peut réaliser beaucoup de réformes. Durant le même temps, le bois de pulpe ayant pris une valeur considérable, les spéculateurs commencèrent à affluer, à donner beaucoup de besogne aux préposés du gouvernement.

En 1905, le premier ministre actuel jugea qu'il était nécessaire de réformer le service de surveillance, en recrutant un personnel plus instruit, plus compétent, et que l'on pourrait employer à l'année. Deux élèves furent envoyés à l'Ecole forestière de Yale, pour y prendre leurs degrés d'ingénieur forestier. A leur retour en 1907, chacun d'eux fut chargé d'organiser la surveillance dans un petit district. Les résultats ayant été jugés bons, ils furent autorisés à s'adjoindre quelques élèves assistants et leur champ d'action fut agrandi, si bien que l'an dernier, l'honorable M. Allard divisait la province en quatre districts, en donnant un à chacun des deux ingénieurs forestiers, un troisième à feu M. Langelier et le dernier étant administré par le département avec le concours des agents. En même temps, le gouvernement décidait de créer une école forestière qui ouvrait ses portes au mois de septembre 1910. On y donne des cours à onze élèves.

Par suite du décès de M. Langelier, l'honorable M. Allard jugea le moment opportun de réorganiser le service forestier sur une nouvelle base. L'ingénieur forestier en chef de la province fut nommé chef de ce nouveau corps; sous ses ordres furent placés tous les gardes-forestiers de l'ancien régime afin de pouvoir conserver ceux qui étaient bons et les élèves forestiers furent engagés pour assister dans les travaux. Comme le chef du service forestier est en même temps directeur de l'Ecole forestière, cela lui permet de bien connaître les élèves et de faire le choix de ceux qui devront travailler plus tard pour le gouvernement.

Le service forestier est chargé de tous les travaux d'exploration du territoire non arpenté de la province, de la classification des sols, de la surveillance des opérations forestières qui se font sur les terres de la Couronne, du reboisement et des autres travaux et études techniques du département au sujet des forêts.

Le personnel actuel comprend l'ingénieur forestier en chef et son assistant, trois ingénieurs civils, 20 élèves forestiers, 40 gardes-forestiers et six mesureurs-experts.

Ce service coûtera peut-être cher, mais nous avons la conviction que les résultats atteints justifieront amplement les déboursés faits par le gouvernement en même temps que celui-ci peut se glorifier d'être entré dans la véritable voie.

Quant aux détails sur le mécanisme de la gestion, je renverrai mes auditeurs au rapport annuel que vient de publier le département des Terres et Forêts.

Nous avons au sein du département une autre section qui s'occupe exclusivement de la protection des forêts contre le feu, dont M. W. J. C. Hall est le chef. Le service forestier s'occupe de toutes les autres questions extérieures du département, son chef relève du surintendant des Bois et Forêts.

Prof. D. P. Penhallow, professor of botany at McGill University, died on Oct. 26th last on board the steamer Lake Manitoba. Prof. Penhallow was much interested in forestry and was a speaker at the 1906 Forestry Convention.

Survey Methods and Costs.

Expert Forester Writes of the Work on Large Quebec Limits.

'What is a forest survey going to cost?' is the first question that confronts the advocate of this, the initial step in forest management.

Much depends on the character of the survey, of course. In a former issue of the *Canadian Forestry Journal* (December, 1909) was given a description of the Nova Scotia forest survey, or reconnaisance, concluded this fall, together with the estimated cost, this being less than twenty-five cents per square mile.

In the September, 1909, issue of the Forestry Quarterly, Mr. Ellwood Wilson in an article entitled 'Survey Methods and Costs for a Large Area,' writes of survey work of a different character, done for a large pulping concern. The methods of the two surveys are radically different, a fact which must be borne in mind in noting the difference in cost, etc.

Costs of the Survey.

The cost of the first surveys was $20.00 per square mile, but this was subsequently cut almost in half, i.e., to $10.28, and still further experience is likely to bring the cost below this latter figure.

The cost per square mile varied greatly, the lowest cost on any limit being $6.75 and the highest $18.14. In the latter cases the limits were further away from the base of supplies and the portaging was much heavier. In the cheaper surveys two plane tables were used where usually but one was employed.

The average cost per square mile was $10.279. The average cost for the party per day was $18.12. The cost of food per man per day was 17.5 cents.

Preliminary Conditions.

The territory to be surveyed had been, for purposes of sale, roughly surveyed by the provincial authorities into berths. These were laid out along the principal rivers, and measured ten miles along the rivers by five miles in depth. In some cases limits are laid out behind these again, where the width of the land between the rivers permitted.

The difficulties of the mapping were increased by the fact of there being no satisfactory maps to serve as a base for the making of the more exact one. The territory was practically unsurveyed, there had been no triangulation work done, and so there were no points located to which the work could be 'tied,' and what surveys had been made were inaccurate.

Organization of the Party.

The question of a large vs. a small force was decided in favor of the latter as offering the following advantages: (1) the first cost of equipment would be less; (2) the expense would be spread over a longer time, and (3) the men would be better trained for the work.

The party consisted of eight or nine men, being composed usually of the chief, assistant chief, two rodmen, the cook and three laborers. Sometimes the party is enlarged to nine or ten.

What the Maps Show.

The amount of information to be placed on the maps was decided by the purpose for which the maps were required. No attempt was made to mark elevations, as the company lets out all its cutting to jobbers who do their own road-making, in which work the elevations are chiefly required.

Boundaries, lakes, rivers and streams are accurately located. 'The areas in the different types of timber, burns, etc., were considered throughout the work as of paramount importance. . . . Our maps show all rivers, streams and creeks, all lakes, ponds, swamps and muskegs, limit, county and exploration lines, summer and winter roads, logging roads, trails, portages, camps and dams, boundaries of burnt areas, windfalls, lumbered areas, timbered areas, black spruce swamps, jack pine in pure stand, etc. Careful notes of types, reproduction, logging condition, logging waste, etc., are made.'

Field Work.

The work of the parties included also reblazing the limit lines, the setting up of new corner posts and other monuments, the running of lines that had been destroyed or never run and the thorough clearing-out of all lines and blazing of all trees within ten feet of the line.

In the field work a traverse board with telescopic alidade was used. For the chief traverses the distances were ascertained with the stadia rod and for the minor traverses pacing was used for the distances. The party averaged 2.43 square miles per day. The best day's work (distance in lineal miles) was twelve miles in one day in March on a river traverse, when the ice had formed a crust on the snow after a thaw.

Making the Map.

The scale adopted was that of 4,000 feet (three-quarters of a mile) to an inch. One limit (50 square miles) was placed on each sheet, and from these a map of the whole, on a smaller scale, is to be built up. The conventional signs adopted by the Dominion Forest Service were used.

On the completion of the base map the same party will go over the territory in detail to estimate the timber.

The Question of Supplies.

The transportation of supplies accounted for much of the expense. The nearest base of supplies was usually distant from 25 to 70 miles from operations. Supplies had to be driven in by sleighs or wagons where there were roads, and after that by dog-sled or canoe.

Provisions are hauled to the ground in winter, as far as possible. For each section to be mapped a central camp is located. The party works from this until it becomes too far to walk from the camp to their work; then a temporary camp is established, to which provisions are brought from the main camp.

Commission on Conservation.

Brief Report of Second Annual Meeting at Quebec, Jan. 17, 1911.

The Commission of Conservation held its second annual meeting in Quebec city on Jan. 17 in the Legislative Council Chamber.

Hon. Clifford Sifton, chairman of the commission, presided, and at the morning session gave a review of the work done by the commission during the year. He made reference to the opposition made by the commission to the Long Sault dam project and to the attempt made to incorporate the International Canal and Transportation Company, whose object was to construct a canal from Lake Superior to the headwaters of the Saskatchewan river.

In regard to waterpowers the report of the hydro-electric engineer of the commission was almost ready for publication. A bill had also been submitted to the Dominion government regulating the granting of waterpowers by the Dominion authorities.

The appointments of officers and work of the Committees on Public Health and on Lands were also noted.

The Committee on Forests had recommended the setting aside of the Eastern Slope of the Rocky Mountains as a forest reserve, a measure which had subsequently been put into effect by order-in-council and was also included in a bill already before Parliament. The committee also recommended the passing of a bill penalizing the railway companies for allowing fires to spread beyond their rights of way and had made an investigation of the forest fires of the season of 1910.

Information regarding mines was being collated and much information had been prepared regarding the fish and game and fur-bearing animals of the Dominion.

Dr. J. W. Robertson, C.M.G., reviewed at considerable length the work done by the Committee on Lands during the year. He also dealt with methods of farming, condition of home life on the farms, weeds and the question of wood-lots.

At the afternoon session Mr. F. D. Monk, M.P., introduced the question of the control to be exercised by the government over waterpowers, and explained the provisions of his bill before Parliament. Considerable discussion took place relative to the bill. Among other things the difficulty of applying the same conditions all over the Dominion was pointed out.

A committee was finally appointed to bring in a resolution on the matter, which later reported recommending that grants of waterpower be made to extend over a limited period only, and this after a full study of their value, etc.; that a value be set on the privilege at the time of alienation and that the rental be revised periodically, and that the rates charged to the public be under the control of the Railway Commission, even where the grant had passed from the original grantee to another.

Hon. W. C. H. Grimmer discussed various legal difficulties in the administration of the fish and game.

Dr. B. E. Fernow gave an account of the system of forest protection in vogue in Sweden.

At the evening session, which was a public one, Mr. C. C. James, Deputy Minister of Agriculture for Ontario, spoke on 'What Ontario is Doing for the Improvement of Agriculture.' His address referred particularly to the work of the Ontario Agricultural College, especially with regard to its extension work.

Dr. C. A. Hodgetts, Medical Adviser to the Commission, then gave an address, illustrated by stereopticon views, on 'Unsanitary Housing.' He laid stress on the fact that slum conditions were becoming all too prevalent in some Canadian cities.

After the report of the committee noted above had been given, the meeting adjourned.

Protecting Limits by Telephone Lines.

Private initiative and enterprise frequently anticipates government action in many lines of endeavour, and in the line of forest protection a well-known lumberman of Quebec, Mr. William Power, ex-M.P. (recently elected a director of the Canadian Forestry Association) is showing the way to all the Canadian governments in installing telephones throughout one of his limits, mainly with the idea of assisting in the protection of the forest from fire.

The limit in question is owned by the River Ouelle Pulp and Lumber Company, and is situated along the line of the National Transcontinental railway in Kamouraska county, Quebec, near the International boundary. The work of installation has been carried out under the personal supervision of the manager, Mr. W. Gerard Power, son of Mr. Wm. Power.

Fifty-two miles of telephone have been strung, forming a circular chain of communication through the heart of the tract. Telephones have been installed for the use of the fire-rangers at five different points along this line, and portable telephones, capable of being adjusted to the line at any point, will be supplied to the rangers and carried with them in the woods, provided suitable instruments can be procured. If not, ordinary wall telephones are to be installed every two miles along the line of the National Transcontinental, where it passes through the limits.

The application of the telephone to this use is not entirely new on the limits of the River Ouelle Company. Over two years ago a line was built ten miles from Ste. Perpetua village east, connecting with the Kamouraska Telephone Company's line. This first trial of the system proved such a success that during the summer of 1910 it was extended and a line built from the company's office in St. Pacome, crossing the River Ouelle into the sixth range of the parish of St. Onesime, and thence following the Ste. Anne colonization road to the National Transcontinental, a distance of about seventeen miles. Thence it follows the railway right of way to Lake Ste. Anne, where two guardians are kept during the summer season. From this point the line continues west for nine miles to Ste. Perpetua, joining here the original installation. Another branch runs from the Ste. Anne road east to Powerville, where the company has their mill, following the railway right of way.

The advantage of the arrangement is obvious, and its adoption has come into vogue quite extensively of late years in the United States. A ranger, using the telephone to notify headquarters of a fire, can in a short time have assistance sent him, in this way having frequently the opportunity to confine to a comparatively small area a fire which threatened to develop to serious proportions.

ONTARIO'S WORK IN 1910.

Mr. E. J. Zavitz, in his report read before the annual meeting of the Ontario Experimental Union in January, gave some interesting particulars regarding the work of tree distribution and planting done by the Department of Agriculture of that province. During 1910 200,000 trees were sent out to private planters throughout the province, and an equal number was used by the Department in its planting at the Norfolk County Forest Station. The planting material sent out consisted largely of Scotch pine, white ash, white elm, sugar maple, soft maple, catalpa and black locust. A number of planters also received walnuts, butternuts and hickory nuts for use in planting in woodlots or plantations.

The total number of trees sent out during the last five years in connection with the scheme of free distribution amounts to nearly two million. Plantations have been started in about forty counties. Most of the planting has been done in the south-western part of the province. From eighty to ninety-five per cent. of the trees are living.

About sixty collections of forest tree seedlings have been sent out to schools under the direction of the schools section of the Experimental Union.

For the coming season the department has on hand for distribution trees of the following species: white pine, Scotch pine, white cedar, black walnut, butternut, hickory, sweet chestnut, red oak, maple, white ash, elm and black locust. At present there are in the forest nursery about 800,000 forest plants in nursery lines and about 1,500,000 seedlings in seedbeds.

UNIVERSITY OF TORONTO NOTES.

The Faculty of Forestry has grown apace until at the beginning of the academic year 1910-11 just a round fifty students were registered; this total was diminished during the term by the withdrawal of two who followed the calls of practical life.

The registration started rather slowly, many of the students employed on summer work finding it difficult to give up their employment when the session began.

This summer employment of its students is perhaps the most interesting fact about the Faculty. Of the thirty-nine students who had been registered the preceding year, at least thirty-one found occupation in their own field, and, since five of the remaining eight dropped out of the course, actually only three for various reasons were unemployed. The Forestry Branch of the federal government employed the largest number, namely, twelve, who were engaged in forest surveys in the West.

The next best employer was the Canadian Pacific Ry. Co., which had several parties out (ten Torontonians being employed) investigating various problems. Three men were temporarily and one man continuously employed by lumber companies in estimating timber and mapping timber limits, the three continuing in other forest work; while the Nova Scotia forest reconnaissance occupied, in addition to Dr. Howe and Mr. White, members of the staff, the services of three students.

Two men sought experience in the tree nurseries of the Pennsylvania Railroad Company; a few only were employed in fire ranging.

Another feature of interest is that this Faculty has attracted the attention of our neighbors, three of the new students coming from the States.

City and Province naturally furnish the principal contingent of the student body, namely twenty-one and fifteen respectively. New Brunswick and Nova Scotia furnish three and two respectively, and far-away Alberta and British Columbia each one.

A novel course has been inaugurated, namely, that on 'Business Law,' conducted in seminary style by Mr. John D. Falconbridge, lecturer at the Law School, — a course designed to produce clear legal thinking and such knowledge of the principles and elements of law as any educated man should really possess, but especially those that are likely to transact business.

The six-year course, designed to give a broader education in addition to the professional course, attracts only a few; yet there are four men brave enough to submit to the longer term of education.

Over 4,000,000 cords of pulpwood were used in the United States during 1909.

DEATH OF PROF. W. R. FISHER.

It was with much regret that members of the Canadian Forestry Association learned of the death of Mr. Wm. R. Fisher, M.A., Assistant Professor of Forestry at Oxford University, which took place on Nov. 13th last, at the age of sixty-four. A native of Sydney, N.S.W., Mr. Fisher was educated at St. John's College, Cambridge, taking his degree of B.A. with mathematical honors in 1867. From 1869 to 1889 he served in the Indian Forest Service, attaining the rank of Conservator of Forests. He was editor of the Indian Forester from 1881 to 1889, was president of the Royal English Arboricultural Society in 1904, and served on several parliamentary committees on forestry. He was a member of the staff of the Royal Indian Engineering College at Cooper's Hill for several years, and, when the staff of the School of Forestry was transferred to Oxford, became Assistant Professor of Forestry there. He is well known for his numerous writings on forestry subjects, especially as assisting Prof. Schlich in his 'Manual of Forestry.'

THE STATES AND THE NATIONAL FORESTS.

Of the entire revenue received from the National Forests of the United States twenty-five per cent. goes to the state in which the particular reserve is situated, to be spent for school and road purposes. The several states thus received, for the fiscal year ending June 30, 1910, the sum of $506,200, an increase of $67,500, or a little over fifteen per cent., over the amount received for the preceding year. The payments are designed as an offset to the loss of income sustained by the state through the withdrawal of the forest land from entry under the public land laws.

THE FARMER'S PLANTATION.

The above is the title of a bulletin written by Mr. A. Mitchell, of the Forest Nursery Station, Indian Head, Sask., and lately issued by the Forestry Branch as its Bulletin No. 10. It applies particularly to conditions on the prairies. Among the questions taken up are the planning of the plantation, preparation for planting and the actual operation of planting and the care of plantations after planting. Under the latter head the matter of pruning and thinning have full attention. The bulletin is illustrated with thirteen half-tone engravings. Copies of it may be obtained by addressing R. H. Campbell, Superintendent of Forestry, Ottawa.

Constitution and By-Laws of the Canadian Forestry Association.

(Published in accordance with a resolution passed at the Annual Meeting of the Association, March, 1910.)

I. NAME.

The name of the Association shall be: *The Canadian Forestry Association.*

II. OBJECT.

Its objects shall be:—

(1) To advocate and encourage judicious methods in dealing with our forests and woodlands.

(2) To awaken public interest to the sad results attending the wholesale destruction of forests (as shown by the experience of older countries) in the deterioration of the climate, diminution of fertility, drying up of rivers and streams, etc., etc.

(3) To consider and recommend the exploration, as far as practicable, of our public domain and its division into agricultural, timber and mineral lands, with a view of directing immigration and the pursuits of our pioneers into channels best suited to advance their interests and the public welfare. With this accomplished, a portion of the unappropriated lands of the country could be permanently reserved for the growth of timber.

(4) To encourage afforestation wherever advisable, and to promote forest tree-planting, especially in the treeless areas of our north-western prairies, upon farm lands where the proportion of woodland is too low, and upon highways and in the parks of our villages, towns and cities.

(5) To collect and disseminate, for the benefit of the public, reports and information bearing on the forestry problem in general, and especially with respect both to the wooded and prairie districts of Canada, and to teach the rising generation the value of the forest with a view of enlisting their efforts in its preservation.

(6) To secure such forestry legislation from time to time from the federal and provincial governments as the general interests demand, and the particular needs of the people seem to require.

III. MEMBERSHIP.

Its membership shall include all who pay an annual fee of $1.00 or a life membership fee of $10.00.

IV. OFFICERS.

The officers shall comprise an honorary President, a President, a Vice-President, a Secretary, an Assistant Secretary, a Treasurer, the editor of the official organ of the Association and twenty-one directors, and from (and including) the Association year 1909-10 the ex-presidents of the Association shall be members of the Board of Directors.

V. ELECTIONS.

These officers shall be elected by ballot at the annual meeting of the Association, and shall serve one year, or until their successors are elected. Vacancies occurring during the year may be filled by the Executive Committee.

VI. EXECUTIVE COMMITTEE.

(1) The officers shall comprise an honorary President, a President, a Vice-President, a Secretary, an Assistant Secretary, a Treasurer, the editor of the official organ of the Association and thirty directors.

(2) In addition to the above all past presidents of the Association, from (and including) the Association year 1909-1910, shall be *ex-officio* members of the Board of Directors.

VII. ANNUAL MEETING.

The annual meeting of the Association shall be held during the month of February in the City of Ottawa, upon such a date as shall be decided by the Executive Committee of the Association, a notice of one month of which shall be given to each member by the Secretary.

VIII. SPECIAL MEETINGS.

Special meetings shall be held at such times and places as the Executive may decide, a sufficient notice of which shall be sent to each member by the Secretary.

IX. AMENDMENTS.

Amendments to the Constitution can be adopted only by a two-thirds vote of the qualified members present at the annual meeting of the Association, and a notice of such intended amendment shall be given with the notice calling the meeting.

BY-LAWS.

President.

The President shall preside at all meetings of the Association.

Vice President.

In the absence of the President a Vice-President shall preside at all meetings of the Association; and in the absence of all of them a President pro tempore shall be elected by the meeting.

Secretary and Assistant Secretary.

The Secretary shall keep a record of the proceedings of the Association and of the Executive Committee and shall be custodian of all documents, books and collections ordered to be preserved.

He shall conduct the correspondence of the Association and shall keep a list of members with their residences and shall notify members of the time and place of meeting of the Association, and in his absence his duties shall be discharged by the Assistant Secretary.

Treasurer.

The Treasurer shall have the custody of all moneys received, and shall deposit or invest the same in such manner as the Executive Committee shall direct, and shall not expend money except under direction or approval of the Executive Committee. The financial year of the Association shall close on December 31st of each year.

Order of Business.

At the regular meeting of the Association the order of business shall be that proposed by the Executive Committee and announced by the Presiding Officer. In the absence of such prepared order of business, the following shall be observed:—

(1) Calling to order.
(2) Reading of minutes.
(3) Reading and referring or disposing of letters, accounts, etc.
(4) Reports of Committees.
(5) Inquiries and notices of motion.
(6) President's address.
(7) Papers, addresses and discussion by members and others invited by the meeting.
(8) Nomination and election of officers.
(9) Unfinished and miscellaneous business.
(10) Adjournment.

O. A. C Students working on Ontario Government plantations, Norfolk Co

The Ontario Agricultural College

GUELPH, Canada

Offers an excellent preparatory course for students intending to graduate in Forestry. In addition to the various subjects taught, many of which are prescribed by the Faculty of Forestry at Toronto University, students have the privilege each year of securing five months' field instruction and practical experience in the annual operations on the Government Nursery located in Norfolk County, Ont.

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G. C. CREELMAN, B.S.A., LL.D.,
President.

DIRECTORS' REPORT FOR 1910.

(Continued from Page 15.)

bers. The list now includes the Bank of Montreal, Canadian Bank of Commerce, Merchants Bank, Molsons Bank, Bank of British North America, Imperial Bank, Bank of New Brunswick, Royal Bank, The Quebec Bank, and Bank of Hamilton, while the Traders Bank makes a grant of fifty dollars.

Since the last annual meeting the membership list has been carefully revised, 504 names struck off because of death or non-payment of fees; 736 names added, leaving the total at 2,703, gain of 232 for the year. These 2,703 members were distributed as follows: Nova Scotia, 95; Prince Edward Island, 9; New Brunswick, 234; Quebec, 543; Ontario, 1,095; Manitoba, 127; Saskatchewan, 120; Alberta, 121; British Columbia, 215; Yukon Territory, 3; Newfoundland, 2; United States, 96; British and Foreign, 43.

Conclusion. — With the membership larger than ever before and with the different parts of its organization working harmoniously, it is hoped that the year 1911 will be one of the best in the records of the Association.

All of which is respectfully submitted.

LOST LIVES IN AUGUST FOREST FIRES.

The total number of those who lost their lives in the forest fires in the western United States during the latter part of August is seventy-seven; these are the Forest Service figures. They were, for the most part, temporary employees of the Forest Service engaged for the express purpose of fighting the fires.

The Guelph (Ont.) Water Commissioners will continue this year the work of afforestation of the catchment basin of the system, begun last year. About 150,000 trees will probably be planted this year. Of the trees put in last spring over 75 per cent. (a good proportion) are living.

TREES FOR THE LAWN

Weeping birch, mulberry, ash, willow and elms. All kinds of shrubs, fruit and ornamental trees, hedge plants, roses, vines, evergreens, from 10c up.

CHAS. BAKER,

London Nursery, Ridout Street.

Phone 2222. London, Ont., Can.

WOOD-LOT MANAGEMENT.

When properly located and cared for the wood-lot should prove a most productive and increasingly profitable portion of a Canadian farm. Unfortunately the condition of the average wood-lot is becoming less satisfactory from year to year. The two causes which contribute most largely to this decadence are the common practice of selecting from time to time the better trees for removal, leaving the poorer for the basis of future crops, and the all but universal practice of opening woodlands for grazing of stock. Some idea of the economic importance of better methods of management for farm woodlands may be gathered from the fact that in Ontario alone there are some seven million acres of wood-lots, besides several million acres of waste lands which should be re-forested. The Dominion Government through its Forestry Branch and the Ontario Government through its Department of Agriculture are already doing excellent work in disseminating a knowledge of better methods of wood-lot management and in providing planting material at reasonable cost for those wishing to improve or extend their woodlands.—*Dr. Judson F. Clark.*

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Canadian Forestry Journal

VOL. VII. MARCH-APRIL, 1911 No. 2.

Takakkaw Falls, on Yoho River, in Yoho National Park, B.C.

OTTAWA, CANADA.

Oliver Chilled Plow Works,

Chilled & Steel Walking & Riding Plows.

South Bend, Ind., Feb. 4, 1911.

THE DAVEY TREE EXPERT CO.
Kent, Ohio.

Gentlemen:

Answering your inquiry of Feb. 3rd, will say that the trees treated by your experts are doing nicely and I consider the treatment a success. One fine tree in particular would have been a total loss had it not been treated, but now it is healing over and apparently is in good healthy condition.

Very truly yours,
(*Signed*) *J. D. OLIVER.*

The American public has little idea of the damage which has been done by the outrageous practices of the *ordinary* tree-men. This damage is almost equally the work of the ignorant type, whose only tools are the axe and saw, and of most of those claiming to be "*tree doctors.*" A tree expert is one who not only understands tree life from a scientific and practical standpoint, but who is skilled in the proper methods of tree surgery by long training under John Davey and his men. Tree surgery is a science which cannot be learned outside of the Davey Institute of Tree Surgery, the only school of its kind. It is self-evident, therefore, that the Davey Tree Experts are the only men who are fully qualified to handle wounded and crippled trees.

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We are now arranging the spring and summer itineraries of our special representatives. These educated and trained tree-men will this season cover the country east of the Missouri river. Write us how many trees you have, what kinds and where located. It is entirely possible that, while in your vicinity, one of our men can make an expert examination of your trees without cost or obligation to you. *Write now* to avoid delay. Every year we have applications for examination which come so late that it is inconvenient or impossible to give them attention. We will send you a handsomely illustrated booklet giving full particulars and explaining the science of tree surgery and containing ample proofs of its efficiency when practiced by trained and reliable men of a responsible business organization.

THE DAVEY TREE EXPERT COMPANY,

534 Olive Street, - - - Kent, Ohio.

(Operating the Davey Institute of Tree Surgery.)

Canadian Forestry Journal

VOL. VII. OTTAWA, MARCH-APRIL, 1911 No. 2

THE official organ of the Canadian Forestry Association. A magazine devoted to the interests of forestry and in general to the advocacy of the wise and conservative use of the natural resources of Canada.

Annual Subscription. - $1.00
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Literary Contributions and communications regarding editorial matters should be sent to Mr. F. W. H. Jacombe, Canadian Building, Ottawa. Communications regarding subscriptions, changes of address, and advertisements should be sent to the Secretary Canadian Forestry Association, Canadian Building, Ottawa, Canada.

The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

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Counties May Have Forest Reserves.

Ontario Legislature Provides for Formation of Municipal Reserves.

Years of persistent work had their reward at the last session of the Ontario legislature, when that body passed an Act authorizing county councils to buy up and, where necessary, plant to forest trees waste lands suitable for that purpose and to issue debentures to raise money for that purpose up to $25,000.

The full text of the provisions of the Act are as follows:—

1. This Act may be cited as 'The Counties Reforestation Act.'

2. The municipal council of a county may pass by-laws:—

(a) For acquiring by purchase,

lease or otherwise, such lands designated in the by-law as the council may deem suitable for reforestation purposes;

(b) For planting land so acquired and for preserving and protecting the timber thereon;

(c) For the management of such lands and the sale or other disposal of the timber grown thereon;

(d) For the issuing of debentures from time to time for the purpose of providing for the purchase of such lands to an amount not exceeding $25,000 to be owing at any one time.

3. No by-law shall be finally passed under this Act until the same shall have been approved in writing by the Minister of Agriculture.

4. (a) Municipal councils of townships in districts without county organization shall have all the powers, privileges and authority conferred by paragraphs (a), (b) and (c) of section 2 hereof on councils of counties.

(b) The councils of such townships shall have power and authority to levy by special rate a sum not exceeding $200.00 in any year for the purpose of providing for the purchase of such lands.

To Mr. Thos. Southworth, late Director of Forestry and Colonization for the province, Mr. E. J. Zavitz, Forester to the Department of Agriculture, and others who have been prominent in the agitation for this measure, the passage of this Act must be very gratifying, as it is, in less degree, to all interested in the forestry work of this province. Several of the county councils, particularly those of York, Simcoe, and the united counties of Northumberland and Durham, are already looking forward to action in this direction.

The Forest Ranger.

By Samuel J. Record, Yale Forest School. *

'The biggest and best thing about the Forest Service is the loyalty of its men. They are working for all the people and that is worth while.'

Gifford Pinchot.

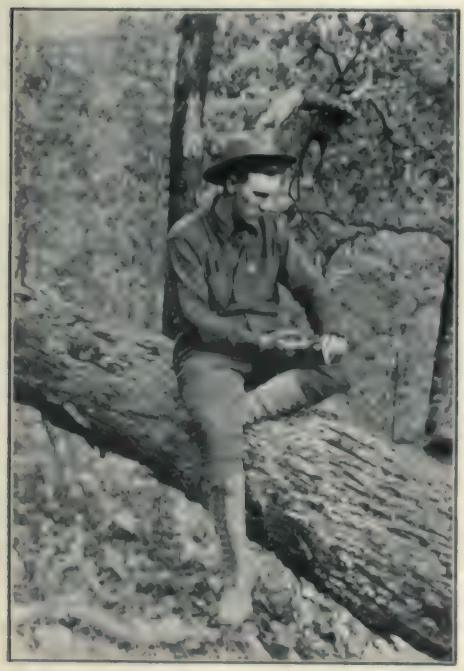
There are nearly two thousand field men actively engaged in the protection and administration of the two hundred million acres upon which Uncle Sam is practicing forestry. Constituting this vast domain are one hundred and fifty reservations, called National Forests. Their present value is more than two billions of dollars.

Each National Forest has an organization and staff of its own. The man in charge is the forest supervisor, and the men comprising his field force are the forest rangers. There are now 1,200 rangers in the service. There are three grades in this position—Assistant, Deputy and Forest Ranger proper. Promotion from one grade to the next is made on the ground of efficiency and period of service, and the positions are held through merit alone, this branch of the Government service being particularly free from favoritism and political patronage.

Once every year or so the United States Civil Service Commission conducts an examination to determine the fitness of applicants for these positions. These examinations are

*Mr. Record, the author of this article, is a graduate of the Yale Forest School (1904), and, after some years with the U. S. Forest Service, which included experience as forest supervisor, last summer took a position as a member of the Yale Forest School staff.

along practical lines and require two days for completion. The first day is devoted to written tests designed to show the applicant's knowledge of the Government land laws and regulations, the timber business, the principles of surveying, mapping and reconnaissance, the live stock industry and other phases of forest work. The second day is a field test on surveying, timber estimating, packing a horse, throwing the 'diamond hitch,' saddling and riding, for all these are part of the ranger's everyday life.



Mr. Record, author of the article, in Forest Service Uniform.

Answers to the written questions frequently reveal a phase of the subject not contemplated by the examiner. One applicant, when asked how National Forests were created, replied that 'they were created by God and staked out by man.' Another young hopeful attempted to conceal his ignorance of a 'steam nigger' by saying it was 'that part of an engine which has a peculiar work to perform.'

A forest ranger's salary varies from $1,100 to $1,500 a year. He is required to keep one or more saddle horses and also pack-horses where needed. He furnishes his own saddle, saddle-pockets, blankets, pack outfit and personal equipment, and pays his own expenses. Sometimes he makes camp alone, at others he stops at a ranch house or 'throws in' with a sheep herder or 'cow-puncher.' The important thing is to find water, for a 'dry camp' after a hard day's ride is a discomfort that even a tenderfoot studiously avoids. For the benefit of strangers in a National Forest the roads and trails are posted with cloth notices giving direction and distance to camping places, ranches and settlement.

Every National Forest is divided into ranger districts, containing on an average about 160,000 acres each. The ranger in charge is provided with permanent headquarters, since private accommodations cannot usually be found in the big woods. In time all ranger headquarters on a forest will be connected by telephone with each other and with the supervisor's office, affording ready means for communication and establishing close relations among all of the forest officers.

Ranger headquarters consist of a house, barn, well, garden and pasture. His office is supplied with a stove or fireplace, table, chairs, typewriter, filing cases, card index, blank form cabinets and miscellaneous equipment. If the ranger has a wife it becomes her duty usually to write her husband's letters and reports, and to see that all papers are filed so that they may be located without ransacking the place.

A tall flagpole stands near the house, and the presence or absence of the flag indicates whether or not the ranger is at home. Special effort is made to make the ranger headquarters substantial and attractive and to serve as models for the entire community.

The district ranger fills a very im-

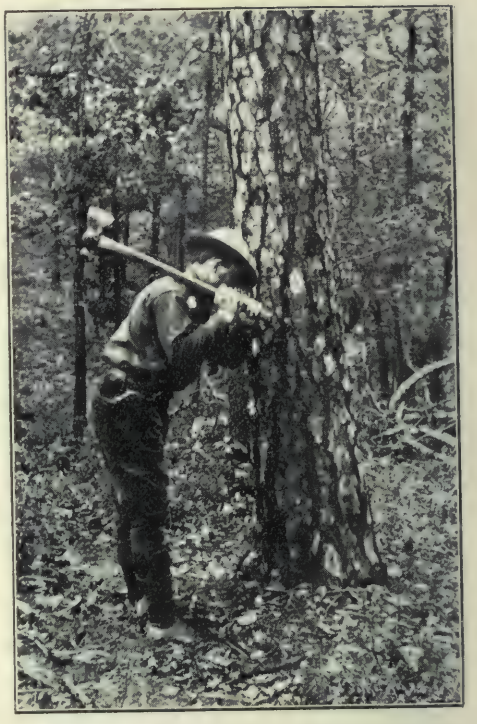
portant position. All the work on his district is under his immediate supervision and he reports directly to the forest supervisor in charge. Frequently from one to several assistants are assigned to him. Sometimes his territory is subdivided for the purposes of fire patrol, timber-sale work or the better handling of grazing. Temporary quarters are provided for his assistants where needed. Additional ranger stations are established over the forest for the purpose of raising horsefeed and forage for the forest officers' horses in thinly settled regions.

The kind and amount of work a ranger does depends upon his particular location. On many forests grazing is the principal business at present, and the men are kept busy preventing trespass, allotting the range, counting cattle and sheep, poisoning prairie dogs and destroying predatory animals. Special hunters and trappers are employed to rid the range of wolves, bobcats, coyotes, bear, mountain lions and other animals that prey upon stock.

It takes a man of special temperament to make a success of hunting and trapping. The work is hard, lonely and dangerous. One must be a naturalist, thoroughly versed in the wiles and instincts of every animal he seeks. The little tricks of removing the man-scent from traps and deadfalls, the proper arrangement of tempting baits, the care to make everything appear natural, the ready reading of signs and trails, the location of dens and runways, and so forth, mark the expert.

The veriest novice may bury a trap in a runway, but it requires the art of a professional so to arrange a few stones and twigs on either side that the animal unconsciously changes his gait to avoid them and plants a paw squarely in the trap.

On most forests selling timber is the principal business. All timber within National Forests which can be cut safely and for which there is actual need is for sale. The ranger



Marking Trees for Cutting on U.S. National Forest.

usually does the work of cruising the land, estimating the timber and making a map of the area, and submits a complete report to his supervisor covering all details of a sale. Sometimes special reconnaissance parties of expert woodsmen, usually rangers, are sent from one Forest to another to map large areas or perhaps an entire Forest, and prepare plans for future timber sale business.

Timber that is sold must be officially marked before being cut. The ranger goes through the woods with a long-handled marking ax bearing on its poll the raised letters 'U.S.' He carefully scans the trees, noting their condition and kind, and pictures to himself all the while how the stand will appear after certain trees are removed. Having decided upon those to be cut, he goes from one to another and with a well-directed glancing stroke of his ax

blazes the tree near the ground and stamps the spot 'U.S.' A second blaze higher up is added to assist the cutters in locating their timber, especially when the ground is deeply covered with snow.

While the timber is being cut, the ranger scales the logs and sees that the purchaser complies fully with the terms of the contract, among which are that all stumps be cut low, that all merchantable timber be utilized, that needless waste and damage be avoided and that the tree tops be so disposed of by lopping close to the ground, or scattering, or piling and burning as to reduce the danger from subsequent fire.

No mineral, homestead or other entry within a National Forest goes to patent until the ranger or other government officer has investigated thoroughly and submits a report showing that the law has been substantially complied with. Timber depredations and grazing trespass are also investigated and reported. Such duties require thorough knowledge of the Government land laws and test a man's ability to obtain competent evidence. Only the law violator or evader has aught to fear from the ranger, who is at all times willing to advise and assist the bona fide prospector, miner and homebuilder.

On many National Forests considerable tree planting is being done. On the Kansas and Nebraska Forests the men's time is devoted almost exclusively to nursery and planting work. On the Ocala and Choctawhatchee in Florida, turpentine orcharding is the principal source of revenue and demands most attention. On the Wichita National Forest and Game Refuge in Oklahoma, caring for the big herd of bison is the important work. The bison's greatest enemy is the Texas fever transmitted by the bite of Texas fever ticks. To guard against ticks the pastures are burned over annually, and no cattle or other stock are allowed within the inclosures. At frequent intervals the game warden examines each animal through a field glass and the presence of a single tick of any kind means a shower bath of crude oil for the entire herd.

Guarding the Forests from fire is the first and foremost duty of every forest officer, for without adequate fire protection future tree growth is extremely uncertain. Guards and fire-patrolmen are employed during the danger season, fire lines or paths are constructed, watch towers built, telephone lines strung up, trails opened to places that are difficult of access, tool stations established, and various other precautions taken to locate and quickly suppress fires. Should the wireless telephone prove a success it will play an important part in ready communication over the National Forests. Fire fighting is the hardest and most disagreeable work a ranger has to do, and good

Scaling Timber in U.S. National Forest.

judgment and staying qualities are required.

The Forest Service uniform is a neat and inconspicuous olive-green worsted or corduroy, devoid of brass buttons and gold lace. As a sign of his authority each officer wears a small bronze shield-shaped badge bearing in its centre a pine tree—the forester's talisman. Though empowered to make arrests, even without warrant in certain cases, the authority is exercised only in flagrant cases. In some States rangers act as deputy game wardens and render valuable assistance in preventing the unlawful taking of fish and game from regions where hunting and fishing are the best and where poaching is hardest to detect. Though often armed and usually a good shot, it is considered very bad form for a ranger to make any public display of his gun or his marksmanship.

The ranger keeps a diary covering in detail each day's business. When the Forests were first established his work was largely patrol and a sample page from one man's diary is said to have been as follows:

'October 1, 1904. Patrolled out of my blankets; patrolled to the creek; built a fire; patrolled to breakfast and patrolled after my horse. Patrolled all day; patrolled to supper and to bed. Cold night; used my report blank for extra cover; patrolled to sleep.'

But things have changed and now the rawest recruit does more than patrol, and his reports, while numerous, are concise and to the point.

The rangers are a loyal and enthusiastic corps of men, on the alert to resent any outside criticism of the Service or its methods. Should you overhear a couple of rangers exchanging hard luck stories of long hours, small pay, slow promotion, superabundance of red tape and a general lack of appreciation of themselves and their troubles by their superior officers, you may wonder why they stay by their jobs. They stay because the work appeals to them. The love of God's out-of-doors, the pleasure of breathing pure air fragrant with the smell of the pines, the dependence upon one's own resources, the joy of doing a big task well, the opportunities for hunting and fishing, of exploring new lands, and the discipline and training one unconsciously receives, these are compensation greatly in excess of the limited pay the Government can offer.

CANADIAN CLUBS AND FORESTS.

At the luncheon hour on Friday, Jan. 20, Dr. B. E. Fernow was the guest of honor at a luncheon given by the Canadian Club of Quebec, and afterwards gave an address on the subject: 'What the members of Canadian Clubs can do to protect our forests.'

In the absence of Lt.-Col. B. A. Scott, president of the club, the chair was taken by the vice-president, Mr. G. A. Vandry.

Prof. Fernow, in his address, referred to the preservation of Canada's forests as a patriotic duty incumbent on Canadians, despite the great temptation to be extravagant which the very abundance of the country's resources gave rise to. As business men Canadians should carefully consider what their assets were and 'take stock' of their forests and of their other natural resources. Properly preserved and cared for the timber supply of Canada could be prolonged indefinitely.

MAP OF TREE DISTRIBUTION.

A vivid idea of the number of trees distributed to farmers throughout the prairie region is given by a map recently issued by the Dominion Forestry Branch. The map is of the same size as the regular 'homestead maps,' and on it are indicated, alongside the name of each railway station, the number of trees sent there during the time that the scheme has been in operation.

ONTARIO TIMBER CUT FOR 1910-1911.

It is estimated that the cut of white pine on Ontario Crown lands for the winter just past amounted to 640,000,000 feet, an increase of 35,000,000 feet over the cut for 1909-1910. The cut of other timber is estimated at 100,000,000 feet, an increase of 5,000,000 feet. To offset this the cut of pulpwood is thought to have decreased by 38,000 cords, only about 100,000 cords having been cut.

The Riding Mountain Forest Reserve.

By Geo. King, Editor Dauphin (Man.) Press.

When one reads of awful forest fires such as last summer and autumn raged in the states of Montana and Idaho, and to a less extent in the state of Minnesota and the provinces of British Columbia and Ontario, it is a matter of more than usual interest to come in touch with what is being done in our own northwest by the forestry department, under the minister of the interior.

While much work is being done to protect the timber belts of the west from fire, undoubtedly the most important work is being carried on in the Riding Mountain forest reserve. This reserve is one of the largest in the west. It takes in 42 townships and is over 100 miles in length. It has a thick growth of spruce, poplar, birch and some tamarac and oak. While fires have done great damage to the timber along the foot of the mountain, no great damage has been done in the reserve, which of late years is attributable to the energy and the watchfulness of the forest rangers under the direction of the chief forest ranger with headquarters at Dauphin.

Start of the Work.

The practical work of protecting the reserve started in the year 1908, when a line, which might properly be termed a survey line, was started west of Norgate in township 20, range 15, and run for ten miles northward by Forest Ranger McLeod. This line was run in the first place with the object of demarcation.

In the following year, 1909, the work of continuing the line was started and 25 miles were covered in a northwesterly direction, carrying it to a point seven miles west of Ochre River. This line was cut a width of eight feet, and might be called a good road, which also acted as a fire guard.

When the heavy fires were running last spring in the poplar timber in the mountain the rangers found that where they had room to work they could do good work in this class of timber in suppressing the flames. With the knowledge thus gained in fighting the fires so successfully, it was decided to widen the line from eight to sixteen and twenty feet. In making the clearing the trees are cut down close to the ground and all parts removed, as well as the underbrush, the fire being thus prevented from spreading when it reaches the opening. This opening presents a pretty appearance when the leaves are on the trees, somewhat after the form of an extended tunnel, as one glances down it.

Country Traversed by the Line.

There have been ten miles of this wide line cut this year, through belts of heavy poplar and birch with thick undergrowth. The line in many places crosses big gulches and cuts, some of these, according to surveyor's notes, being two hundred and fifty feet deep. The great tract through which the line runs is regarded as the hogback of the mountain.

The formation of the mountain is bed rock, being of heavy slate and shale, covered with a layer of boulder clay. On the top of the clay is the usual covering of loam and leaf mould.

Use of the Reserve.

The land surrounding the mountain is of the best for the pursuits of

agriculture, and on either side are to be found railways and thriving villages. How valuable this timber is to the settlers can readily be imagined. Timber may only be taken out by farmers under close supervision of the department, and then only for use on their farms. No owners or operators of sawmills can acquire any of it. The idea of the government is to help the settler and at the same time develop the country's resources. All present cutting of timber is being done under close supervision of the rangers and with a view to reproduction. Wherever cutting has been done to such an extent that portions of the reserve are denuded of tree growth, reforestation will follow in its wake.

Cutting must all be done under permits issued by crown timber agents, and these permits are issued exclusively to farmers. Among the other important duties pertaining to the rangers is the work of preventing settlers squatting in the reserve, and the preventing and extinguishing of fires.

The Rangers and Their Duties.

Wm. A. Davis is chief forest ranger, and has headquarters at Dauphin. His division not only covers the Riding Mountain but several other reserves at more distant points, so that great responsibility rests on his shoulders. In this reserve Mr. Davis has four rangers under him, located at about equal distances apart. There are John W. Robertson, Gilbert Plains; W. Middleton, Elphinstone; Franz Hoffman, Scandinavia, and Albert McLeod, Kelwood.

The whole system of western forest reserves is under the direction of A. Knechtel, a man of wide experience, who served seven years with the forestry department of the state of New York, joining the Dominion Forest Service in 1908.

The system of guarding against fire and controlling it, once it gets started, in the Riding Mountain is about as perfect as it can be under the circumstances. Once a fire breaks out the rangers get in communication with headquarters at Dauphin, either by telephone or telegraph, and the machinery is set in motion to command all the assistance required to control it and put it out.

Among the minor duties of the rangers is that of procuring seed of spruce and other trees. It is no easy matter to procure the cones of the spruce, as they grow on the extreme ends of the limbs of the tall trees. When picked, the cones are sent to the Forest Nursery Station at Indian Head, Sask. There the seed is extracted. Part of it is returned for reforestation purposes to the reserve and the rest is sown at Indian Head, whence the trees produced are distributed to the farmers throughout the prairie provinces to be used in beautifying and protecting their homes.

Value as a Summer Resort.

The Riding mountains abound in beautiful lakes of the purest water. By cutting roads into the reserve it is possible to create a number of splendid resorts, which could be used by the settlers in the vicinity during the summer season.

A Game Preserve.

The rapid extinction of the large game in the country suggests that this reserve, which is one of the best deer runs remaining in the west, be created into a big preserve. If the monarchs of the forest, the elk and the moose, are to be preserved, this must be done. Each year the bands which roam the reserve are lessening in number and it will be only a matter of a few years before there will be none left if the present rate of

(Continued on page 56.)

*Since this article was written, Mr. W. A. Davis has been given charge of the Duck Mountain and Porcupine forest reserves, with headquarters at Dauphin, and Mr. McLeod made chief fire ranger of the Riding Mountain reserve.

Wealth in Fish and Game

By Thomas Ritchie, Pres. Belleville, Ont., Fish and Game Association.

The public are slowly awakening to the vast importance of conserving the natural resources of this Province and commencing to realize what wealth would accrue if these were wisely administered, yet little practical effort, so far, has been made to secure to the people the full fruits of what nature has so bountifully bestowed upon us.

It is not necessary to dwell here upon the value of preserving and properly utilizing our forests and of afforesting the millions of acres which have been cut over and other land unfit for agricultural purposes, or of dealing with the rich stores of mineral wealth that these may enrich our own people rather than foreigners, or of developing the power we hold in our numerous lakes and rivers, or securing for the present and future generations a supply of food fish in our great lakes. Every citizen is interested directly or indirectly in these matters, and each stands to profit thereby if the community can be brought to see things in their proper light and so insist that they be dealt with in a prudent and effective manner.

Of the above sources of wealth the public are more or less aware, but there is still another which ought eventually to prove of immense value to the country of which but few are cognizant, that is, our game fish and other game. Now it is not on account of the value of these in themselves (indeed they are of comparatively little intrinsic value) that attention ought urgently to be directed to their conservation, nor is it for the purpose of affording pleasure to a few persons of leisure in our own midst. This is worthy of some consideration, but is not by any means of the most importance, for so far as the great body of our people are concerned, perhaps not more than one in a hundred cares one iota whether there be any game in either forest or stream. What is here insisted on is that it is on account of the economic value to the province as a whole, not for the benefit of the few, that active and effective measures ought to be instituted for their protection.

The matter of chief importance connected with our game fish and other game is the attraction these have for foreign tourists and the amount of money left by them in the country each season. There seems to be little conception at present of what value this source of wealth will eventually become to the province of Ontario if due precautions are taken in time to prevent our rivers, lakes and forests from being depleted.

Every one knows of the valuable asset we have in the silver mines of Cobalt and Gowganda and the gold of Yukon; none need to be told of that, but few seem to be aware that in the attractions we possess in our rivers, lakes and forests lies latent a greater fund of wealth than all these combined. This will appear to most persons to be rather a broad assertion and somewhat startling, but nevertheless it can be shown to be a fact.

The state of Maine had for many years expended large sums in protecting and restocking the rivers and lakes with game fish, and to satisfy the people there that the expenditure was profitable and yielded a rich return, the government took steps in 1907 to ascertain definitely how many persons entered the state that year attracted by what the fish and game offered. They found that above half a million persons, men,

women and children, had so entered.

Thus, reckoning on the moderate sum of thirty dollars spent there by each person, it was found that fully fifteen million dollars were left by these pleasure-seekers in that state in one season alone, spent by them throughout the state and that in localities where most needed and where it would do most in developing the country.

Now the output of silver in Cobalt and gold in the Yukon together for 1907 amounted to but $14,600,000, and moreover a great part of this went out of the country to foreigners who own the mines. The other remains in the country.

When we consider that Ontario is about five times the size of Maine, and contains far greater attractions in its many thousands of beautiful lakes and rivers, with their invigorating air, all originally teeming with fish, and its woods with game, and that it is more easy of access than Maine is to the wealthy millions to the south of us, and, moreover, with the exception of Maine and the Adirondacks, there is no field whatever east of the Mississippi River to attract tourists at all comparable to what Ontario furnishes, it can be readily seen that we have conditions in Ontario to secure yearly an immense influx of wealth eventually far exceeding what now goes into Maine and of greater value to us than all our gold and silver mines. Is it then not worth while?

It is not only the amount of money brought into the country by tourists but it is money spent largely in remote parts where it will do most good while the whole province profits thereby.

Planning a Farm Homestead.

By A. Mitchell, Forest Nursery Station, Indian Head, Sask.

When the farmer is making his plans for the summer's work, the laying out of his permanent premises —shelter belts, garden, orchard and so on—must receive some attention and the following suggestions may be helpful.

In arranging for permanent works such as buildings and plantations, it is very important to allow for every contingency which may arise, for if a mistake is made at the beginning it usually is not very easy rectifying it.

Leave Plenty of Room.

An error often made in laying out the farm grounds is to have them too small—sufficient perhaps for present needs, but allowing no room for expansion.

This is a great mistake. Land is plentiful and an acre or two extra inside the main shelter belt will never be missed. It may, indeed, be made to produce its crops of roots or seed grains, or be used as a run for young stock, so that it may be as profitable a piece of land as is on the whole farm. In fact, it can be utilized for anything that the needs of the owner and the expansion of his business may suggest.

The shelter belt should be wide and the trees close together, as this arrangement enables the trees to shelter one another and shade the ground better and more quickly, and so lessens the work of cultivation. Besides, a broad belt will provide more and better posts, poles, etc., when thinnings come to be made.

In arranging the plantations they should be kept far enough away from the buildings so that there will be no trouble from snowdrift in winter; a distance of about thirty yards is pretty safe.

The accompauying plan, while not

at all claiming to be a model, embodies some of the most important points to be considered in laying out the farm grounds.

A Suggested Plan.

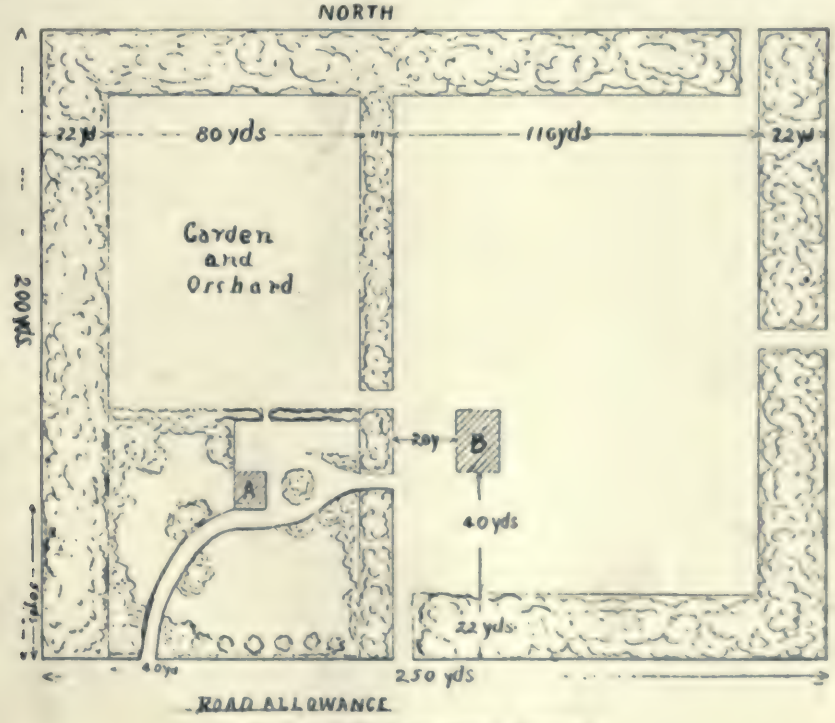
In the plan here presented the outer boundary encloses a space of over ten acres. The outer belt of trees is four rods wide and embraces an area of over three acres. There is room for fifteen rows of trees at four feet apart or twenty at three feet, and the belt is wide enough to afford efficient shelter and to protect itself by excluding the drying winds.

The closeness of the planting will shorten the time required for cultivation, the most expensive item in planting operations.

The house is set fifty yards back from the road to allow of a fair-sized lawn in front, and forty yards from the western plantation to avoid trouble from snowdrifts. It is at the same time close enough to the plantation to be sheltered at as early a date as possible from the prevailing winds. The smaller plantation to the east screens it from the yard, and the one to the north affords early shelter from that direction. There will be little or no trouble from snow behind these as the other plantation will catch the drifts.

Sometimes very cold winds are experienced from the south and shelter should be provided in that direction, but at the same time this is the side from which in this case the best view is obtained and it should not be sacrificed if possible.

These two matters are provided for in the hedge of Caragana (or other shrub, or even spruce), which can be kept trimmed to a height of four or five feet—sufficient to afford a good shelter, yet not high enough to obstruct the view. The row of standard trees inside the shelter hedge can be pruned up to clean stems about eight feet high, and encourag-



Planting Plan for Farm Grounds.
A, house; B, barn.

ed to develop spreading heads. They will thus afford a good deal of shelter and yet not obstruct the view from the lawn. Instead of the row, groups of trees, arranged irregularly and surrounded with shrubs, might be substituted for the single row of standards.

Two entrances are arranged to the premises. Stock will be driven out and in at times and might damage the lawn and shrubs if a second one were not provided. The curved house entrance is in accordance with modern lines of landscape art, and so are the irregular groups of shrubs set here and there bordering the lawn. There is grass space enough for a tennis court.

A turning place is provided, as it is not always convenient to have rigs with callers coming into the farm yard. If the house were further back from the road the turn could have been in front but this would have curtailed the lawn space. The turn is convenient also for delivering coal to the basement of the house.

The garden and orchard is convenient to the house and of a fair size and yet closed off from the yard.

The barn is far enough from the plantation to be clear of snowdrifts and yet close enough to the small plantations to quickly have the benefit of its shelter from the prevailing winds. The barn yard is about three or four acres in extent, affording plenty of room for additional buildings, poultry and hog runs, and so on, whenever necessary.

While it is not intended that this plan should be looked upon as a model, it covers most of the points that should be considered when laying out the farm grounds.

A Few Suggestions.

Everything should be arranged as conveniently as possible, as for instance the curve of the entrance to the house should always be towards the town or wherever the most traffic is, and the house should always be nearer the town than the other buildings so that strangers approaching the place will see the most attractive part first.

The arrangement of the shrubs round the lawn should be irregular and they should be in groups of varying size, and plenty of them should be used, the plants being no wider than four feet from each other. This is the only way to obtain that natural massed effect which is so pleasing.

With a little care and study of the different shrubs, very fine results may be obtained and there is no reason why any farmer should not, in a very few years, have as well arranged and attractive a home as any city man.

Meantime when laying out the permanent premises, allow lots of room for expansion; lay the foundations broad and deep; the details may, if necessary, be worked out later.

Is a Snow-trap Advisable?

Sometimes it is thought necessary to have a narrow strip—say, a row or two of willows—outside the main plantation to act as a snow-trap and prevent damage from snow-drift in the plantations. Such damage, however, does not often occur, and the recovery of the broken trees usually takes place readily enough. Besides, in practice it has been found that after a few years the outer willow belt is neglected and gets choked up with grass, and very soon there is only a bush here and there to be seen.

Over the greater portion of Saskatchewan and Southern Alberta where the snow fall is lighter, it is a question if much benefit is to be derived from such snow-traps.

The Penobscot Lumber Co., whose headquarters are in Brunswick, Maine, is inaugurating a system of planting on their limits, and will establish nurseries at Salmon River and Marin's Head, N.B., and Cookshire, P.Q. Mr. Robt. Connelly, manager of the company, has the matter in charge.

A Long Fight Ended.

Forest Reserves in Appalachian and White Mountains now assured.

For years past the advocates of forestry in the United States have been endeavoring to secure legislation through which forest reserves could be created in the Eastern United States, chiefly in the White Mountains and in the Appalachians. The effort has all along met with vigorous and persistent opposition, but in February last a bill, known as the 'Weeks' bill, was finally passed through Congress, and received the assent of President Taft on March 1st.

The members of the Canadian Forestry Association present their hearty congratulations to their U. S. confreres on this successful ending of one of the biggest fights ever waged in forestry annals on this continent, and trust that their highest anticipations may be realized in regard to the reserve.

The Act does not directly create forest reservations in the Appalachian region. In fact it is so general in character that under its provisions action might be taken in any part of the United States. A good general idea of the nature and scope of the Act may be gained from its title: 'An Act to enable any State to cooperate with any other State or States, or with the United States, for the protection of the watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers.'

The first section of the Act enables any State of the Union to enter into agreement with any other State or States 'for the purpose of conserving the forests and the water supply of such States.'

The next section puts in the hands of the Secretary of Agriculture the sum of $200,000 for the purpose of co-operating 'with any State or group of States, when requested to do so, in the protection from fire of the forested watersheds of navigable streams.' This authorization limits the amount of federal money expended in any State in any given year to the amount appropriated by that State for the same purpose during the same year.

The most significant sections of the Act are those which provide for the establishment of forest reserves. The first element in this provision is an appropriation of $2,000,000 a year for five years ending with June 30, 1915, 'for use in the examination, survey and acquirement of lands located in the headwaters of navigable streams or those which are being, or which may be, developed for navigable purposes.' The expenditure of money under this provision of the Act is conditioned (1) upon investigation by the Secretary of Agriculture, (2) examination and approval by the Geological Survey, (3) recommendation for the purchase of lands and fixing of price by the National Forest Reservation Commission, and finally (4) actual purchase by the Secretary of Agriculture, with approval as to payments and land title by the Attorney General of the United States.

The National Forest Reservation Commission created by this Act is to consist of seven members, including the Secretaries of War, of the Interior and of Agriculture, two members of the Senate (chosen by the President of the Senate), and two members of the House of Representatives (chosen by the Speaker). This commission is to re-

port annually to Congress about December 1st on the operations of the preceding fiscal year. The specific provisions of the Act as regards the Secretary of Agriculture and the Geological Survey, together with provisions for reservation of minerals and timber to the original owners of purchased lands, and also provisions for homestead entries on small tracts suitable for agricultural purposes may be quoted as follows:

Sec. 6. That the Secretary of Agriculture is hereby authorized and directed to locate, examine and recommend for purchase such lands as in his judgment may be necessary to the regulation of the flow of navigable streams, and to report to the National Forest Reservation Commission the results of such examinations: Provided, that before any lands are purchased by the National Forest Reservation Commission said lands shall be examined by the Geological Survey and a report made to the Secretary of Agriculture, showing that the control of such lands will promote or protect the navigation of streams on whose watersheds they lie.

Sec. 7. That the Secretary of Agriculture is hereby authorized to purchase, in the name of the United States, such lands as have been approved for purchase by the National Forest Reservation Commission at the price or prices fixed by said commission: Provided, that no deed or other instrument of conveyance shall be accepted or approved by the Secretary of Agriculture under this Act until the legislature of the State in which the land lies shall have consented to the acquisition of such land by the United States for the purpose of preserving the navigability of navigable streams.

Sec. 8. That the Secretary of Agriculture may do all things necessary to secure the safe title in the United States to the lands to be acquired under this Act, but no payment shall be made for any such lands until the title shall be satisfactory to the Attorney-General and shall be vested in the United States.

Sec. 9. That such acquisition may in any case be conditioned upon the exception and reservation to the owner from whom title passes to the United States of the minerals or of the merchantable timber, or either or any part of them, within or upon such lands at the date of the conveyance, but in every case such exception or reservation and the time within which such timber shall be removed and the rules and regulations under which the cutting and removal of such timber and the mining and removal of such minerals shall be done shall be expressed in the written instrument of conveyance, and thereafter the mining, cutting and removal of the minerals and such timber so excepted and reserved shall be done only under and in obedience to the rules and regulations so expressed.

Sec. 10. That inasmuch as small areas of land chiefly valuable for agriculture may of necessity or by inadvertence be included in tracts acquired under this Act the Secretary of Agriculture may, in his discretion, and he is hereby authorized, upon application or otherwise, to examine and ascertain the location and extent of such areas as in his opinion may be occupied for agricultural purposes without injury to the forests or to stream flow and which are not needed for public purposes, and may list and describe the same by metes and bounds, or otherwise, and offer them for sale as homesteads at their true value, to be fixed by him, to actual settlers, in tracts not exceeding eighty acres in area, under such joint rules and regulations as the Secretary of Agriculture and the Secretary of the Interior may prescribe; and in case of such sale the jurisdiction over the lands sold shall, ipso facto, revert to the State in which the lands sold lie. And no right, title, interest or claim in or to auy lands acquired under this Act, or the waters thereon, of the products, resources or use thereof after such lands shall

have been so acquired, shall be initiated or perfected, except as in this section provided.

Lands purchased under the provisions of this Act are to be administered as 'national forest lands' under Sec. 24 of the Congressional Act, approved March 3, 1891, and various supplemental Acts. The Secretary of Agriculture is authorized to divide any lands purchased 'into such specific national forests' as may to him appear best for administrative purposes.

The Act provides that five per cent. of any money received during the fiscal year from each of the national forests thus created shall be paid into the treasury of the State in which any such forest is located, 'to be expended as the State Legislature may prescribe for the benefit of the public schools and public roads of the county or counties in which such national forest is situated.' No county, however, is to receive an amount in excess of forty per cent. of its total income from all other sources.

Finally, the Act appropriates $25,000 per year for the expenses of the National Forest Reservation Commission, the money to be immediately available.

Lands may be bought only in the States whose legislatures have consented to the acquisition of land by the United States for the purpose of preserving the navigability of streams. The States which have already taken the necessary action are Maine, New Hampshire, Maryland, Virginia, West Virginia, North Carolina, Tennessee, South Carolina and Georgia. The first lands to be examined for purchase will be in the Appalachian and White Mountains, which because of their altitude, steepness and lack of protection are in a class by themselves. Careful examinations which have been going on for the last ten years have proved that the conditions which affect stream-flow to an extreme extent are to be found in relatively limited areas, which are scattered more or less widely. By careful selection it is believed that much can be done for the permanent improvement of the watersheds with the purchase of a relatively small part of the land.

Timbered lands may be bought either with the timber standing on them or with reservation by the owner of the right to cut the timber under certain rules to provide for perpetuation of the forest. These rules will form a part of the agreement for the purchase of the land. Since, however, the government can not pay high prices, it is not regarded as probable that much land bearing a heavy stand of merchantable timber can be bought. Culled and cut-over lands may be bought, as well as land covered with brush which is useful for watershed protection, burned land and abandoned farm land, whether cleared or partially or wholly covered by young timber growth. Good agricultural lands will not be considered.

Hon. Jas. Wilson, Secretary of the federal Department of Agriculture, indicates that the policy of the Commission will be to make the money available go as far as possible. 'For the most part,' he says, 'we shall have to buy cut-over lands or lands without much merchantable timber. I want to make it plain at the start that I shall recommend this class of land only when it is offered very cheap. The lands acquired by the Government will be held as National Forests. They will be protected from fire and the growth of the timber will be improved as much as possible. The lands will not be game preserves, but will continue to be open to the public for hunting and fishing in accordance with the laws of the State in which they are situated. All their resources will be available for the public under reasonable conditions. Another point which I wish to emphasize is that we are not going to take from people their homes in order to put the lands into National Forests.'

[Courtesy Maine Forest Com'r.

One of Maine's Lookout Stations.

One Means of Fire Detection.

The accompanying illustration shows the 'lookout station' located on Bald Mountain in the state of Maine. These stations take an important place in the work of protecting the forests from fire, both in this state and in its neighbour, New Hampshire. Mr. W. C. J. Hall, Superintendent of the Forest Protective Service of the Province of Quebec, in his report for 1908, thus describes the use of the lookout stations: 'Lookout stations are established on the tops of the highest mountains in the territory to be protected and are connected by telephone with the existing telephone system and provided with range-finders, compass, telescope, etc. Each lookout is placed in charge of a reliable man, familiar with the use of these instruments; this man is also supplied with a map of the surrounding country, and the moment he sees fire in any direction he locates it, rings up the nearest fire warden and tells him approximately where the fire is. He next rings up the limit-owner, whom he also warns of the fire and immediately makes an entry to that effect in his "log," stating the date and hour that each was warned. The lookouts already established in the state of Maine have cost from $500.00 to $600.00 each to install, apart from the instruments.'

The state of Maine now has twenty-four of these stations, most of them constructed and equipped during the last two years. A few were maintained by private timber owners before this, and were taken over by the state. The total cost of construction and equipment during the two years has been $14,664.49.

Provincial Chief Fire Warden W. C. Gladwin, of British Columbia, is urging Vancouver and the towns in its vicinity to buy the forested lands on the watershed of the streams from which they obtain their water supply.

The town of Dauphin, Man., is installing a waterworks system. The water will be brought from Edwards Creek, in the Riding Mountain forest reserve.

La Pépinière de Berthierville, P. Q.

Par A. Bédard, M.F.

La ferme de Berthierville est divisée en deux parties qui se distinguent l'une de l'autre par l'espèce de travaux qu'on y fait, l'une affectée aux travaux purement forestiers et couvrant une aire de trente arpents, l'autre réservée aux travaux agricoles et couvrant une superficie de quarante arpents.

Travaux forestiers.

La partie de la ferme affectée aux pratiques forestières comprend, outre la pépinière et l'arboretum, dont nous disons le but plus loin, un massif forestier de vingt-trois arpents. Cette petite forêt, située à l'extrémité nord de la ferme, est peuplée principalement de bois feuillus. Il est fort probable qu'autrefois le pin blanc, qui aujourd'hui ne prédomine que dans un coupon de la forêt, était mêlé partout aux bois francs et qu'il n'a dû de disparaître peu à peu, pour faire place aux feuillus, qu'à une exploitation intensive et imprévoyante. Aussi ne reste-t-il aujourd'hui en forêt que quelques 100,000 de pin blanc. La forêt, avons-nous dit, est composée principalement de bois feuillus, érables, mérisier, bois blanc et hêtre.

Nous croyons devoir dire aussi qu'autrefois il existait des peuplements de chêne qui ont totalement disparu par les coupes intensives qu'on y fit jadis pour se procurer les bois de marine, et pour faire succéder la culture de la forêt.

Bien que, comme nous l'avons fait voir plus haut, on ait, dans le passé, d'une manière extravagante, extrait des essences précieuses, comme le pin blanc et le chêne, il n'en reste pas moins vrai que la forêt de la ferme de Berthierville est aujourd'hui celle qui offre les peuplements les plus riches de la région, tant par la variété des essences qu'on y rencontre que par la quantité de matière ligneuse en croissance à l'arpent. Ainsi, nous rencontrons des pins blancs donnant six billots à l'arbre, ce qui n'est pas commun dans la région.

Le terrain sur lequel croît cette forêt est légèrement ondulé et est formé d'un sol siliceux surplombant une couche de terre argileuse: ce qui indiquerait que les sables mouvants dont nous constatons la présence au-delà de cette forêt, près du chemin de fer, ont dû, dans le passé, s'étaler ici.

Parcelles d'expériences.

Cette forêt sera subdivisée en huit parcelles d'égale superficie délimitées par des chemins ou allées de vidange. On a déjà, avec le concours des élèves, tracé et déblayé deux allées de huit pieds de large, parallèles, à un arpent l'une à l'autre, servant à la sortie des produits forestiers.

Dans chacune des parcelles dont il est fait mention, on appliquera un système sylvicole différent, suivant la nature des produits que l'on recherche et suivant la nature du peuplement forestier. Ainsi, en certaines parcelles, on favorisera le développement des taillis; en d'autres, celui de la futaie, ici on cherchera à créer une érablière modèle, là on travaillera à reconstituer un peuplement pur de pin blanc.

Inventaire et coupes.

Il va sans dire qu'avant d'appliquer aucun système, on fera un inventaire aussi exact que possible de la quantité des différents bois que cette forêt contient. On a cette année inventorié ⅛ de cette forêt, et dans la parcelle dont on connait le contenu on fera cet hiver des coupes qui ne porteront toutefois que sur les arbres mal venus, défectueux ou de peu de valeur, que l'on a martelés à l'avance afin que les bucherons ne commettent pas d'erreur.

Etude sur la croissance et le défilement des essences forestières.

En même temps que ces coupes seront faites, on étudiera sur les souches et billes d'exploitation le taux de croissance et de défilement des arbres exploités. Les chiffres ainsi obtenus auront leur place dans les tableaux de croissance et de défilement que l'on est à construire pour les différentes forêts de la province. D'autre part, on mesurera le diamètre de chaque arbre, qui doit demeurer après le passage des coupes, et l'on pourra, dans la suite, voir jusqu'à quel point l'exploitation de certains sujets dans une parcelle donnée a influé sur le développement des arbres laissés sur pied dans la même parcelle.

Etudes sur la production du sucre.

Les expériences dont nous venons de parler regardent tout spécialement et uniquement la production de matière ligneuse, cependant on ne s'arrêtera pas là. Comme nous n'avons pas encore en cette province d'étude sérieuse sur l'exploitation des érablières en vue de la production du sucre, nous nous efforcerons de combler cette lacune en recueillant, lors de l'exploitation du sucre, le printemps, tous les data possibles tant sur la quantité moyenne de sucre que nos érables placés

en telle condition et suivant leur âge et leur diamètre, sont capables de produire, que sur la qualité des produits particuliers à telle variété d'érable.

Ainsi donc, la forêt qui forme partie de la ferme de Berthierville est destinée, de par sa nature et le plan de recherches que l'on s'est tracé, à donner un enseignement précieux en ce qui touche l'applicabilité de différents systèmes forestiers dans les bois des petits propriétaires, et la possibilité d'augmenter la production du sucre ou de matière ligneuse par des méthodes de culture scientifiques.

Pépinière.

Nous avons dit plus haut que les travaux forestiers couvraient une superficie de trente arpents et que de cette aire une partie (soit trois arpents) était affectée aux semis et repiquage.

Cette pépinière est destinée, comme l'on sait, à fournir les plants nécessaires au reboisement de 25,000 arpents de sable mouvant que des coupes imprévoyantes ont dénudés, et qui sont situés dans la région de Berthier, aux approches de la voie du Pacifique Canadien. C'est donc pour que les plants de reboisement soient déjà faits aux conditions climatériques et autres avec lesquelles ils leur faudra compter, quand ils seront définitivement installés sur les sables, dont il a été question plus haut, que l'on a choisi pour pépinière la ferme de Berthier. Il va de soi, d'autre part, qu'en plaçant une pépinière à proximité des terrains pour le reboisement desquels elle nourrit les plants, on rend possible le transport de ceux-ci à meilleur marché et sans pertes considérables.

Le sol, qu'on a eu soin d'ameublir par des labours et des hersages judicieux, et de débarrasser ainsi des mauvaises herbes qui s'y étaient mutipliées depuis l'abandon de la ferme, est de bonne qualité et capable de nourrir des plants vigoureux, à enracinement bien constitué.

Dans un coupon de la pépinière (deux arpents environ) subdivisé en planches que séparent d'étroites allées, on a semé des graines d'essences variées achetées qui en Europe, qui aux Etats-Unis, qui au Canada. Les essences qu'on a ainsi propagées, et qui sont aujourd'hui représentées par quelques 350,000 sujets, sont les suivantes: pin blanc, pin noir d'Autriche, pin sylvestre, mélèze d'Europe, épicea, épinette de Sitka, sapins divers, érables, noyer, sapin de Douglas, pin taureau, pin rouge, épinette blanche, épinette noire, épinette piquante, mélèzes japonais, orme, acacia et murier.

Les cinq premières essences de la liste précédente seront employées au reboisement des sables de la région de Berthier. Quant aux autres essences, elles sont cultivées pour être plus tard distribuées aux fermiers désireux de faire, sur leurs terres, des plantations. Il y a quelques essences exotiques que l'on essaie, parce qu'elles sont précieuses, d'acclimater en cette province.

Un coupon de la pépinière d'une superficie de un arpent est affecté au repiquage des plants élevés d'abord dans les planches de semis. Le repiquage ou la transplantation des jeunes brins venus en pépinière a pour but de développer chez ceux-ci, en les éloignant l'un de l'autre, un enracinement vigoureux et une robuste constitution, afin qu'ils puissent plus tard, lorsqu'ils seront soumis à des conditions moins avantageuses, vivre et prospérer. On a repiqué environ 26,000 sujets, choisis entre les meilleurs, et dont la moitié proviennent de graines achetées en Allemagne.

Les semis ont pour la plupart très bien réussi; les pertes qu'on a eu à subir, malgré les meilleurs soins, tiennent surtout au fait que dans les débuts de ces expériences, on a eu à compter avec de grandes sécheresses qui n'ont pas laissé de faire périr un certain nombre de résineux. D'autre part, certaines graines de provenance étrangère, n'ont pas donné les résultats que les fournisseurs nous faisaient espérer, sans doute parce qu'elles n'étaient pas toutes de première qualité. Il me reste à ajouter que certaines essences qui avaient failli à germer la première année, se sont éveillées l'année suivante et se sont rapidement développées. Parmi les essences qui ont donné les meilleurs résultats et ont poussé avec vigueur, citons, au fil de la plume, le pin d'Autriche, le pin blanc, le noyer, l'orme et les érables.

Les expériences de pépinière auront ceci de bon qu'elles nous diront comment, quant à la germination, se comportent sous notre climat telles essences étrangères, quelles essences forestières nous pouvons avec succès introduire dans le pays, quel est le coût des semis et plantations.

Arboretum.

La partie de la ferme affectée à l'arboretum couvre une superficie de quatre arpents, morcelée en quarante-huit carrés de cinquante pieds de côté. On veut ici expérimenter sur certaines essences canadiennes provenant de semis ou extraites, à l'état de sauvageons, de la forêt, afin de savoir quelle est la rapidité de croissance de ces différentes essences suivant leur provenance et quelle est leur vitalité. Les essences qui vont faire les frais de ces expériences sont: le pin blanc, l'orme, le frêne vert, l'érable à sucre, l'érable rouge, l'érable blanc, le liard et le noyer.

British Columbia's Timber Commission.

Final Report Urges Creation of Forestry Department and other Reforms.

The final report of the Royal Commission of Inquiry on Timber and Forestry of the province of British Columbia is a work that has been awaited with much interest, presenting, as it does, the results of the deliberations of that body, after much sifting of the immense mass of evidence accumulated by it during its sessions. Many questions of consequence to the people of British Columbia, and generally to that part of the Canadian public which is interested in forestry, have been taken up, and the decisions and recommendations are of considerable moment. The policy recommended is one whose result, if put into practice, will be watched closely by forest economists generally, and would seem to be likely to produce results considerably more favourable to the province than those attained under the present system.

The chief interest of the report centres in the recommendations, which are here quoted in full as follows:

(1) That a complete cruise of all Crown grant timber lands should be made by the government; that in future the Department of Forests should co-operate with the assessors, and that an annual return should be made of the valuation of all such timber lands;

(2) That as far as possible timber leaseholds should be placed, upon renewal, on a parity with licensed timber lands; and that they should be subject to the same forest regulations;

(3) That the rate of rental and of royalty upon special license should at no time be fixed in advance for more than one calendar year;

(4) That the Land Act be amended so as to empower the government to grant the right of cutting sawmill timber to pulp lessees; and that a new form of license be provided for this purpose in the manner prescribed by your commissioners;

(5) That the same form of license as that provided for pulp lessees be issued to holders of tanbark leases who may desire to cut mill timber upon their leaseholds;

(6) That the present reserve upon unalienated timberland be continued indefinitely; and that when special circumstances necessitate the opening of any portion of this reserve for immediate operations, licenses to cut timber thereon should be put up to public competition, on a stumpage basis;

(7) That licenses to cut timber upon fractional areas adjoining, or surrounding, leased or licensed timber lands, should be put up to public competition and that a 'fractional area' be defined with great care in the wording of the 'Land Act';

(8) That the record of every cruise and survey made by the government in timbered areas should be accompanied by a report concerning the suitability of the land for agriculture; that the power to compel licensees to cut and remove timber from good land be retained; and that at the time of renewal the same provision be inserted in every timber lease;

(9) That the issue of hand-loggers' licenses be discontinued;

(10) That no divided interest in a special timber license be recognized;

(11) That for the convenience of holders one day be fixed in each month for the renewal of all licenses expiring in that month;

(12) That royalty be collected upon all merchantable timber not removed from Crown lands in the course of logging operations;

(13) That operators be required to dispose of debris;

(14) That the protection of forests from fire be undertaken by the government through the agency of a permanent forest organization along the lines of the Northwest Mounted Police; and that it be compulsory for all able-bodied citizens to assist in this work when called upon;

(15) That the cost of fire protection be shared between government and stumpage holders in the manner proposed by your commissioners;

(16) That the provincial government should co-operate with the Dominion Railway Commission; that a vigilant patrol of all railway lines and inspection of locomotives should be established; and that all railway construction should be supervised by provincial forestry officials;

(17) That special licensees should be instructed to proceed with the survey of their holdings; and that all such surveys should be completed not later than the 31st day of December, 1915;

(18) That all operators should be required to make periodical returns concerning their operations to the forestry officials in their districts; and that the collection of information should be undertaken upon much wider lines than hitherto;

(19) That the government should at

once proceed with the establishment of a Department of Forests;

(20) That royalties upon Crown timber should be paid into a forest sinking fund in the manner described by your commissioners;

(21) That by suitable changes in the customs tariff the utilization of low-grade timber should be encouraged.

Following the recommendations, some thirty pages of the report are devoted to an amplification of the recommendations, explaining at length the circumstances that have given rise to each recommendation and the reasons for the recommendation.

The first forty pages of the report are taken up with a general consideration of the present state of the forests of the province, especially with regard to their tenure.

The commissioners found, when they came to get at facts regarding the forests under consideration, that definite information was almost entirely lacking, and that they had to depend largely, if not entirely, on guesses. An example of this is furnished in the case of forest land still in the hands of the Crown. No definite information is at hand, and the commission found the opinions of experts, so-called, to be most conflicting, and were finally driven to form their estimate 'by acting on the more or less popular belief that about one-quarter of the timber under provincial control remains unalienated.' So they arrive at the conclusion that the reserve timber lands amount to 3,750,000 acres, admittedly 'a pure conjecture.'

So in regard to the forest area of the province, no definite information is available. 'For years,' the report runs, 'a legend passed from writer to writer that the province of British Columbia had one hundred and eighty-two million acres of forest land.' After quoting Dr. Fernow's estimate of thirty to fifty million acres of 'merchantable forest,' the commissioners proceed to apply the knife to all the estimates and reach the conclusion that, not including the area of the timber in the Railway Belt, the province possesses but fifteen million acres of 'merchantable timber,' having a total stand of 192,000,000,000 feet, board measure, which amount may be appreciably increased by 'restrictions placed upon the present liberty to destroy and waste.' The Railway Belt is credited with a stand of some 50,000,000,000 feet B.M. in addition to this.

Attention is also given to 'Western Forests and the Timber Supply,' noting the stands in the western United States and British Columbia, the demand from Europe, the depletion of eastern North America and the position of British Columbia in relation to all these facts. The available statistics in regard to B. C. timber lands are given, included under the heads of Timberlands in Private Ownership, Leasehold Timber Lands, Licensed Timber Lands, the Railway Belt, the Forest Revenue of British Columbia (and of Canada) and the Timber Cut of British Columbia. Fire Patrol in the Western States and in Ontario are considered and the Cost of Official Cruising in Western Forests. The Rise in Value of Western Stumpage is discussed and a comparison of stumpage prices in Western Canada and in Ontario and Germany made.

An appendix is provided containing, among other things, the interim report of the commission, articles in regard to the forest policy of the Dominion Government and of other provinces and the United States, suggested legislation and schedules, and other articles of interest.

A number of diagrams are interspersed through the report which present in a graphic way many facts drawn from forest statistics.

FORESTER'S VALUE TO LUMBERMEN.

At a recent meeting of the Foresters' Club of the University of Toronto, Mr. D. J. Turner, of the Turner Lumber Co., gave a talk on lumbering operations. Mr. Turner was one of the first Canadian lumbermen to realize the importance of scientific education as applied to his business. For the past three summers he has employed Toronto students on his limits, making logging maps, estimating timber and locating roads, dams, camps, etc. He exhibited two maps made by students of the forestry faculty which he said were invaluable to him. He considered the trained forester to be a necessity to any enterprising lumber concern and believes in giving the students a chance to train themselves for scientific lumber production. He said it would pay any company to employ these men, even if they only made accurate maps of limits. Mr. Turner gave a brief but comprehensive outline of the work of a lumber company from its organization to the milling of the logs and the sale of lumber, and later spent an hour answering questions from the students and the members of the faculty.

LESS TIMBER CUT IN NEW YORK.

The Forest, Fish and Game Commission of New York State reports a decrease of a billion (thousand million) feet in the total production of timber in the State last year. The amount of pulpwood cut within the State shows an increase, however. The timber cut of the State has been decreasing since 1907.

The Great Miramichi Fire.

(From Cooney's 'New Brunswick and Gaspe').

From the first to the fifth of October, 1825 (a season generally very cool) an extraordinary and unnatural heat prevailed. The protracted drought of the summer, acting upon the aridity of the forests, had rendered them more than naturally combustible; and this, facilitating both the dispersion and the progress of the fires that appeared in the early part of the season, produced the unnatural warmth.

On the sixth the fire was evidently approximating to us; at different intervals of this day fitful blazes and flashes were observed to issue from different parts of the woods, particularly up the northwest, at the rear of Newcastle, in the vicinity of Douglastown and Moorfields, and along the banks of the Bartibog. Many also heard the crackling of falling trees and shrivelled branches, while a hoarse rumbling noise, not unlike the rushing of distant thunder, and divided by pauses, like the intermittent discharges of artillery, was distinct and audible.

On the seventh the heat increased to such a degree, and became so very oppressive, that many complained of its enervating effects. About 12 o'clock a pale sickly mist, lightly tinged with purple, emerged from the forest and settled over it. This cloud soon retreated before a large dark one, which, occupying its place, wrapt the firmament in a pall of vapour. This incumbrance retaining its position till about three o'clock, the heat became tormentingly sultry. There was not a single breath of air. The atmosphere was overloaded; an irresistible lassitude seized the people; and a stupifying dullness seemed to pervade every place but the woods, which now trembled and rustled and shook with an incessant and thrilling noise of explosions rapidly following each other and mingling their reports with a discordant variety of loud and boisterous sounds.

At this time the whole country appeared to be encircled by a fiery zone, which, gradually contracting its circle by the devastation it made, seemed as if it would not converge into a point while anything remained to be destroyed.

A little after four o'clock an immense pillar of smoke rose in a vertical direction at some distance northwest of Newcastle for a while, and the sky was absolutely blackened by this huge cloud; but, a light northerly breeze springing up, it gradually distended, and then melted into a variety of shapeless mists. About an hour after, or probably at half-past five o'clock, innumerable large spires of smoke, issuing from different parts of the woods, and illuminated by flames that seemed to pierce them, mounted to the sky. A heavy and suffocating canopy, extending to the utmost verge of observation, and appearing more terrific by the vivid flashes and blazes that wriggled and darted irregularly through it, now hung over us in threatening suspension, while showers of flaming brands, calcined leaves, ashes and cinders seemed to scream through the growling noise that prevailed in the woods.

All these palpable indications of the approaching ruin were unheeded, probably because the people had never yet experienced the dreadful effects of fire, or had not sufficiently considered the change wrought in the forests by the protracted heat of the summer. Nor could any other reason have betrayed them into a neglect of the warning which Mr. Wright and others endeavoured to propagate. Had the timely admonition of these gentlemen received the attention it merited, many are of opinion that a considerable part of the calamity might have been averted. It would be cruel, however, to harrow the recollection now; experience makes wise men of us all; after having endured the evils, we become astonishing clever in prescribing antidotes.

About nine o'clock, or shortly after, a succession of loud and appalling roars thundered through the woods. Peal after peal, crash after crash, came bellowing the sentence of destruction. Every succeeding shock created fresh alarm; every clap came loaded with its own destructive energy. With greedy rapidity did they advance to the devoted scene of their ministry; nothing could impede their progress; they removed every obstacle by the desolation they occasioned. Several hundred miles of prostrate forests and smitten woods marked their devastating way. They came rushing with awful violence, devouring at every step, and hewing a frightful avenue to the spot where fury was to be consummated.

The tremendous bellowing became more and more terrific. The earth seemed to stagger as if it had reeled from its ancient foundations. The harmony of creation appeared to have been deranged and about to revert into original chaos. Earth, air, sea, and sky, all visible creation seemed to conspire against man, and to totter under

the weight of some dreadful commission they were charged to execute. The river, tortured into violence by the hurricane, foamed with rage, and flung its boiling spray upon the land. The thunder pealed along the vault of heaven; the lightning rent the firmament in pieces. For a moment all was still and a deep and awful silence reigned over everything. All nature appeared to be hushed into dumbness, when suddenly a lengthened and sullen roar came booming through the forest, and driving a thousand massive and devouring flames before it. Then Newcastle and Douglastown and the whole northern side of the river, extending from Bartibog to the Nashwaak, a distance of more than one hundred miles in length, became enveloped in an immense sheet of flame that spread over nearly six thousand square miles.

That the stranger may form a faint idea of the desolation and misery no pen can describe, he must picture to himself a large and rapid river, thickly settled for one hundred miles or more, on both sides of it. He must also fancy four thriving towns, two on each side of this river; and then reflect that these towns and settlements were all composed of wooden houses, stores, stables and barns, that these barns and stables were filled with the crops, and that the arrival of the fall importation had stocked the warehouses and stores with spirits, powder and a variety of combustible articles, as well as with the necessary supplies for the approaching winter. He must then remember that the cultivated, or settled, part of the river is but a long narrow strip, about a quarter of a mile wide, and lying between the river and almost interminable forests that stretch along the very edge of its precincts and all round it. Extending his conception, he will see these forests thickly extending over more than six thousand square miles, and absolutely parched into tinder by the protracted heat of a long summer and by the large fires that had streamed through almost every part of them. Let him then animate the picture by scattering countless tribes of wild animals, hundreds of domestic ones, and even thousands of men through the interior. Having done all this, he will have before him a feeble description of the extent, features and general circumstances of the country, which, on the night I have mentioned, was suddenly buried in fire.

What shall we say of the inconceivably awful and terrific scene that now presented itself? Who shall attempt to describe the condition of a country, tortured and agonized by a hurricane, on every blast of which a messenger of vengeance seemed to ride? Unpardonably vain would that man be, exceedingly high would he stand in his own esteem, who would for a moment think himself capable of describing the situation of a country, overwhelmed by a conflagration whose every blast resembled the emissions of hell, and whose every billow appeared to sustain a demon.

What eye can follow the impetuous course of a raging and consuming fire, sweeping over forests, towns, villages, and hamlets, rooting up trees, ploughing the earth and destroying everything?

What shall we say of the tremendous howling of the storm, dashing broken and burning trees, scorching sand, and flaming houses through the air? What of the boiling surges of the river and its tributaries, flinging their maddened foam all around them, and smashing everything that came within their fury? What of the indescribable confusion on board of one hundred and fifty large vessels imminently exposed to danger, many of them frequently on fire, some burning and others burned?

It is painful to dwell on the agonized feelings and indescribable terrors of the wretched and miserable inhabitants. But painful, however, as such a task would be, to overcome the aversion is not half so difficult as to acquire the competency. Even now the shrieks, screams and cries of a wretched and beggared people, involved in ruin, desolation and despair, ring their mournful cadences upon the ear. Oh, God! merciful and just, how shuddering were the frantic cries, the wild expressions of horror and the despairing groans of hundreds upon hundreds of poor houseless creatures, flying from their smoking habitations, they knew not whither, and mingling the thrilling echoes of their anguish with the yells, roarings and bellowings of wild beasts and domestic animals perishing by fire and suffocation!

Who can gauge the misery, or estimate the agony of poor industrious people suddenly stript of their all, and exposed, almost without a hope, to the dreadful alternative of being either consumed by fire or famished by hunger? What tongue can express the intensity of anguish, what mind can contemplate the poignancy of that sorrow, which must have wrung the bursting hearts of men and women, running half naked, and in wild disorder, deploring their loss, and anticipating their end? Of children looking for their parents, parents looking for their children, and mothers encumbered with their infants, urging their way through the lakes of fire and volumes of smoke?

The more I endeavour to contemplate this awful dispensation, the more convinced am I of my inadequacy to do so. When I strive to raise my mind to a full consideration of it, its overwhelming magnitude crushes the attempt. Every step I make to approach it, the farther am I flung from it; and the more intensely I strain my aching eyes to observe it, the

less I see of it, for its multiplied and various horrors, intervening between the vision and the picture, wrap the whole in impenetrable gloom.

Resting on the indulgence of those who have been kind enough to patronize this work, it may not be improper to state that I was, at the time of the 'Great Fire,' residing within a mile of Newcastle. If my opinion be entitled to any consideration, that is its candid expression: A greater calamity than the fire which happened in Miramichi never befell any forest country, and has been rarely excelled in the annals of any other; and the general character of the scene was such that all it required to complete a picture of the General Judgment was the blast of a trumpet, the voice of the archangel and the resurrection of the dead.

[Photo R. B. Miller.

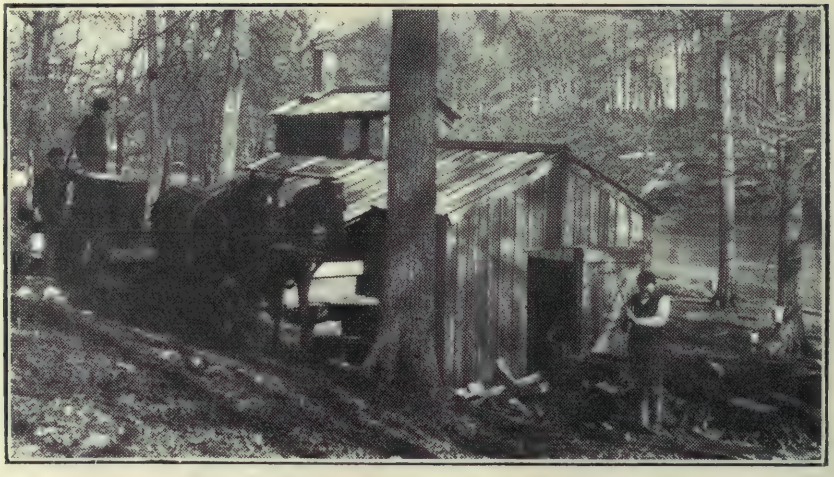
A Tract of Country Burned over in the Miramichi Fire and never satisfactorily reforested.

DR. WM. SAUNDERS RESIGNS.

Members of the Canadian Forestry Association noted with much interest the resignation, from his post as Director of Experimental Farms, of Dr. Wm. Saunders, C. M. G., who has held that position since the establishment of the Dominion Experimental Farms in 1886. Dr. Saunders has shown a keen interest in the Canadian Forestry Association since its organization, and was for some years one of its Board of Directors. Long prior to the foundation of the Association he had shown his interest in the problems of afforestation and the growing of forest trees. On the Central Experimental Farm at Ottawa experimental work in the planting of forest trees was commenced in 1888, two years after its inception, and on the other farms within a short time after their establishment. The work, especially, of the Experimental Farms at Brandon, Man., and Indian Head, Sask., laid the foundations of the extensive plantings made on the homesteads all through the prairie provinces, under the direction of the Dominion Forestry Branch. Dr. Saunders' resignation took effect on March 31st, and he will leave Ottawa in May for a holiday tour in Europe. His many friends will wish him not only a pleasant holiday, but also many years of well-earned rest. Mr. J. H. Grisdale, B. Agr., for some years agriculturist at the Central Experimental Farm, has been appointed Director of Experimental Farms in Dr. Saunders' place.

FOREST RANGERS MEET.

The annual meeting of the forest rangers on the Dominion forest reserves was this year held at Saskatoon, Sask., on April 4, when a number of questions of interest in regard to the management of the reserves were discussed.



[Courtesy War Cry.

The Sugar-house, where the sap is evaporated and converted into Syrup and Sugar.

[Courtesy War Cry.

Collecting Sap.

MAKING MAPLE SUGAR.

The accompanying illustrations show scenes familiar on many Canadian farms in the early spring. A good sugar bush is a valuable asset to its possessor. The average production for one tree is about twelve gallons of sap during the season. Thirty-five gallons of sap will make one gallon of syrup, and four gallons of sap yield one pound of sugar. Maple syrup, during the latter part of April, was quoted on the Ottawa market at $1.00 to $1.25 per gallon. If carefully treated, a tree will yield sap for many years, cases being known where sugar bushes have been yielding steadily for twenty-five years without apparent damage. According to the census of 1901 there were 17,804,825 lbs. of sugar (syrup being included in these figures) of an estimated value of $1,780,482. The province of Quebec alone produced three-fourths of this. The greatest desideratum of the maple sugar industry at present is the elimination of the adulteration of the products. The province of Quebec is looking forward to making special studies of the industry in the near future. The New Hampshire Experiment Station has done quite a little work along this line.

[Courtesy War Cry.

Tapping the Tree.

FORESTS AND STREAM FLOW.

The Forest Service and the Weather Bureau of the United States will co-operate in an investigation of the effect of the forest on stream-flow. The investigation is to be carried on near Wagon Wheel Gap in the Rio Grande National Forest, on two watersheds of similar topography. The stations for observation will be at an altitude of about 9,500 ft. The flow of the two streams will be measured for a period of eight or ten years — long enough to show that under similar conditions the behaviour of the streams is the same. Then one of the watersheds will be cleared and the observations will be continued for a further period of eight or ten years, so that the effects of denudation may be determined.

CANADA'S WORK IN CONSERVATION.

The prosperity of recent years has attracted to the Dominion the attention of capitalists eager to acquire and monopolize for their own benefit whatever revenue-producing assets the country possesses. More fortunate than older countries, Canada still retains control of a vast portion of her national wealth, and it rests with her people of to-day to decide whether she shall waste her heritage like the prodigal or preserve it for the good of millions yet unborn.—New York Outlook.

Hand corn-planters are being used on the Coeur-d'Alene (Montana) National Forest for sowing white pine seed.

It is said that a substitute for cotton has been made from spruce pulp.

A Textbook of Conservation.

The Conservation of Natural Resources in the United States, by Chas. R. van Hise, of the University of Wisconsin. Pages xvi and 413. The Macmillan Company of Canada, Ltd., Toronto. Price, $2.00.

As the result of the movement for conservation of natural resources, an immense amount of information regarding these resources has been collected in the United States (as in other countries to which the movement has extended), but until lately this knowledge has been in such shape that only the specialist in a particular department has had the time—let alone the training—to investigate the mass of material so collected.

This lack of a concise and non-technical compendium of the knowledge on the subject Dr. van Hise has sought to remedy by the publication of this book, which in the space of some four hundred pages presents a synopsis of the results of the investigations of the United States Commission of Conservation. The material for this work was taken largely from the Report of the National Consevation Commission, published at Washington (in a limited edition) in 1909, (Senate Document No. 676, 60th Congress, 2nd session).

The value of the work, as has been hinted, lies in the fact that it enables the reader to form a general idea of a subject of such vast extent and to see the relation of the different parts to each other and to the whole. This, as the author states in his preface, is the chief aim in publishing the work.

The book naturally falls into five parts, namely, (1) Mineral Resources, (2) Water, (3) Forests, (4) Soil, and (5) Mankind—the first four of approximately a hundred pages each, and the last more briefly treated. The subject of the forests, while of the four it has the least letterpress devoted to it, is illustrated by some thirteen or fourteen of the half-tone plates which are found in the book, as well as by six of the twenty figures.

The section devoted to forestry gives a short sketch of the original forests and of the existing forests and takes up the conservation of forest products under the following heads: (1) Reduction of Waste in Cutting, (2) Reduction of Waste in Milling and Manufacture, (3) Reduction of Loss in Turpentining, (4) Extension of Life of Timber by Preservative Treatment, (5) Utilization of By-products, (6) Reduction of Fire Losses and the Control of Fires, (7) Reforestation, (8) Maintenance of Forests upon Essential Areas, (9) Increase of Forest Growth by Stocking, (10) Battle With Insect Pests, (11) Substitution of Other Products for Wood, and (12) Reform of Tax Laws.

Though to the student of forestry the work may not contain much that is new, it will at least give him an idea of the work in other fields, and present in a concise and convenient form the results of much work and research in his own. To the general reader a mine of facts of the utmost interest and use will be opened up.

The fact that the book bears the imprint of the Macmillan Company of Canada is a sufficient guarantee of the excellence of the mechanical work and the handsome appearance of the volume.

The Decline of the Square Timber Trade.

The annual report of the (Dominion) Department of Public Works for the year ending March 31st, 1910, contains an article of considerable interest to students of forestry and of the trade in forest products. The article referred to is contained in the report of Mr. E. T. Smith, Collector of Public Works Revenue, and is in part, as follows:

In the earlier part of the last century, the entire export of Quebec pine was in the form of timber in the squared log, hewn with the axe, and floated down to Quebec merchants, who put the timber in shipping order by butting and dressing it at the Quebec shipping coves, disposing of the culls locally for wharf building and other similar purposes. The greater part of the timber so received and shipped was white pine, squared to a sharp edge on the four corners; deals were made for export to other countries, and reached the English market only in the character of stowage deals. The square logs (and later on waney) were converted into planks and boards at the various sawmills in the great towns in England and in country yards; in the latter pit-sawing was largely in vogue for log conversion.

In 1861, waney pine was made for the

first time, this wood being left with a wane of from three to six inches on the corners, so avoiding the excessive waste of wood resulting from hewing the timber exactly square. Previous to this, the timber was square and of large average, beautifully hewn by the lumbermen in the woods; but board (waney) pine, that is, short logs of large girth, were sent down the drives with the other timber, and soon found their way into the market. Their being cut from the lower part of the tree accounted for the waney character of the logs, but the quality of the timber was excellent. It gradually almost altogether supplanted square pine. To illustrate this point, I beg to submit the following comparison:

Year.	Square pine.	Waney pine.	Total.
1861.....	15,731,000 c.f.	6,735,000 c.f.....	22,466,000 c.f.
1909.....	66,200 c.f.	699,360 c.f.....	765,560 c.f.

While the decline in the quantity of square and waney pine made for the Quebec market was to some extent due to the scarcity of suitable trees to manufacture into timber, it was in a far greater degree attributable to the increase in the deal and board trade. Gradually the produce of the sawmill took the place, for export, of timber in the hewn log.

Before leaving this point, I would observe that in the Ottawa region a large proportion of the trees are suitable to make deal logs, but would not be large enough to be made into waney board pine. This is exemplified by the smallness of the square pine that was latterly taken down from Ottawa. In former days square pine was made seventy, eighty and even one hundred feet cube average; lately it was with difficulty that forty feet average cube was procurable in square pine, and the waney board pine is decreasing in girth annually. Formerly, twenty inches and over, average cube, was easily had as late as 1904, 17 inch average was as large as most manufacturers would undertake to supply, and they frequently fell below this average on delivery at Quebec.

As deals took the place of timber, so lumber is gradually supplanting deals for export. The sawn white pine exported is manufactured by Ottawa valley and western mills, and shipped from Montreal as being nearer the point of production.

This change from the manufacture of timber hewed square in the woods to the bringing of it to the mills in the form of round logs has effected a very important saving of the very best material, formerly left in the woods in the form of chips cut in the process of squaring the trees, which were useless for any purpose except that of spreading the vast forest fires that have destroyed many times more timber than ever was cut with the axe.

The change from sailing vessels to steamer for ocean carriage has necessarily affected Quebec as a shipping port for wood goods, as steamers charge no more on freight from Montreal than from Quebec, and as a matter of fact prefer the first-named port as being under more favorable conditions. Montreal also has the advantage of being nearer most of the mills that now produce pine lumber and deals, as they are generally west of it, and the freight by barge or rail is much less than to Quebec.

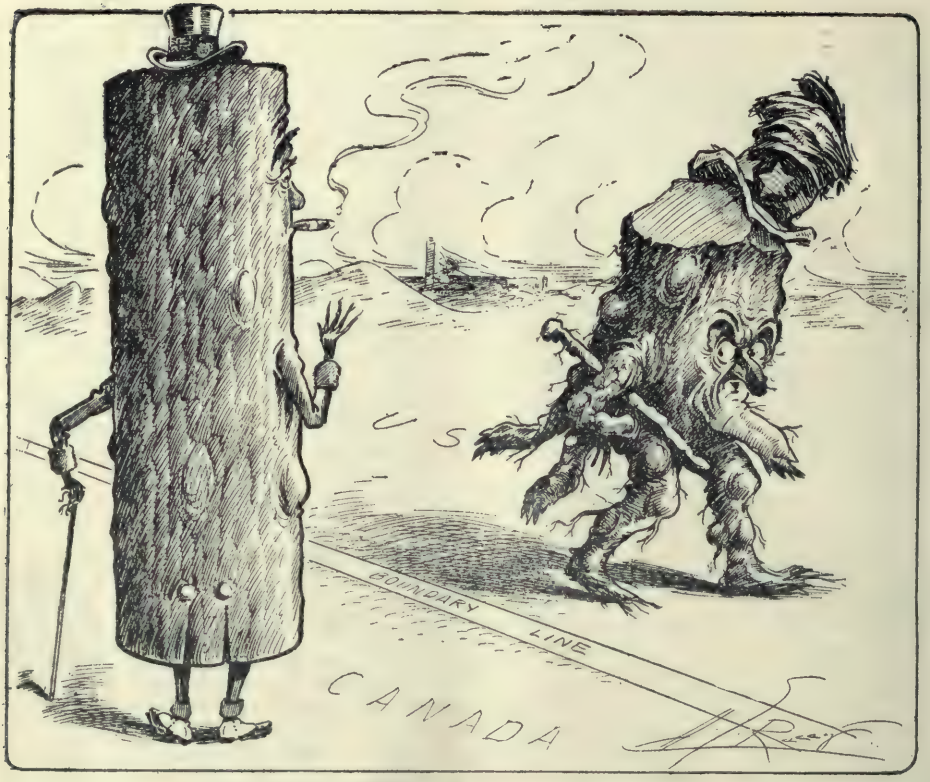
Thus the export business in wood has changed from hewn timber made with the axe and floated down to Quebec in rafts (with a limited proportion of deals sawn at Quebec mills or floated to Quebec from Hawkesbury or Chelsea on the Gatineau) to a small export of timber from Quebec (where hewn timber can best be handled, on account of the facilities given by the tides), and an export of sawn lumber, including some deals, from Montreal. A considerable proportion of the reduced quantity of timber now shipped comes from the United States, which is the source of all the oak exported and most of the elm. The supply of oak suitable for export is exhausted in Canada and the supply of elm is rapidly tending in that direction. Another change is that of shipping by steamer instead of by sailing ship. These two factors account for the loss of the squared timber trade by Quebec and Levis, which was inevitable, but, some authorities say, was accelerated by the restrictions imposed and the wages exacted by the Quebec ship labourers.

Before leaving this subject, it may be interesting to say a few words about the price the lumberman received at Quebec for his timber. I have no record at hand earlier than of the year 1841. I was once shown by an old lumber merchant, the settlement of account between a Quebec merchant and himself, in which he was credited with a raft of square pine, seventy cubic feet average, at 3d. (6c.) per foot.

Mentioning this to another old lumberman, he said it was perfectly correct, for he recalled that he had told the lady, whom he afterwards married, that he could not afford to marry till timber was worth 4½d. (9c.) a foot. He was married in 1846.

In recent years, waney timber 18-inch average has brought as much as 80 cents per cubic foot and square pine 30 to 40 feet average, 40 to 50 cents per foot, a vast advance from the 6c. of 1841 or the 9c. of 1846.

Doubtless the great prices paid for timber limits, higher timber dues levied by the provincial governments and the growing scarcity of large timber, all account



[Montreal Star.

The Result of Timber Intemperance.

Canadian Lumber Interests: 'Dear me! what a come-down! This is a warning. I really must think seriously about conservation!'

for much of the increase in value to the producer, which is practically six times as much as it was in 1862, in which year it is of record that square timber could not be produced and delivered at Quebec under 7½d. or 15 cents per foot.

THE RIDING MOUNTAIN FOREST RESERVE.

(Continued from page 36.)

slaughter is kept up. There are many reasons which could be advanced showing why the two governments, the Dominion and provincial, should unite on a policy of protection of our big game, and the country awaits the move on the part of the legislator who will place the law on the statute books.

NOTES.

Mr. A. C. Flumerfelt, one of the members of the British Columbia Royal Commission on Timber and Forestry, is offering for competition among the school teachers of that province a prize of $50 for the best essay on the subject, 'How and Why We Should Protect Our Forests.'

The headquarters of the British Columbia Mountain Lumbermen's Association (W. A. Anstie, secretary) have been changed from Nelson, B.C., to Calgary, Alta.

A New York corporation has purchased 20,000 acres of timber land in Albert county, N.B.

The area of the timber preserve of New York State is given as, in round numbers, 1,640,000 acres, having a stand of 14,000,000 board feet of timber.

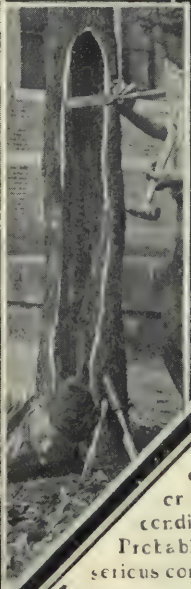
Canadian Forestry Journal

VOL. VII. MAY-JUNE, 1911 No. 3

Group of Forestry Students at Norfolk County, (Ont.), Nursery Station.

OTTAWA, CANADA.

This Cavity Ran Clear Down to the Roots



Really Perfect Trees Are Now Rarely Found

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The Tree Opposite after The Davey Treatment

John Davey
Father of Tree Surgery

A perfect tree is a rare thing. Only a very small percentage of our American trees are so really perfect that they require but a small amount of expert work to make them completely so. In any grove of one hundred trees, native or transplanted, from ten to fifty will be found in a serious condition, as a rule—exceptions to this rule are very rarely found. Probably half of the remainder will show evidences of moderately serious conditions and other half will grade from that stage to nearly perfect.

The Vast Majority of Trees Need Expert Treatment

Abuse and neglect are the two chief factors which are at work to destroy trees. If even the tiniest cavity in a tooth is neglected the inevitable result is either a difficult operation in the course of a few years or the loss of the tooth. Just so with the trees—the small and innocent looking hole you see to-day will be greatly increased in dimensions five years hence. As the cavity grows in size, it weakens the tree and in but a few years the tree will be blown down some windy day, destroying entirely the growth of years.

Prompt Treatment of Tree Ills Saves Money

While a tree is but slightly affected it is a comparative inexpensive matter for it to be treated by the Davey experts. They will clean out the cavity, stop the decay, fill the hole skillfully and the bark will soon heal over it. The longer the tree is neglected the more its life is endangered and the more it costs to save it. It pays to take time by the forelock and give your trees really expert attention when they least need it. As the tree grows worse, treatment becomes more imperative and more expensive.

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The quality service of our experts is now available east of the Missouri river. Our corps of special representatives are making up their travelling schedules for spring and summer. It is quite possible we can arrange to have one of them make an examination of your trees without cost and obligation to you—if we hear from you at once. When you write tell us how many trees you have; what kinds and where located. We will write to you at once and send you booklet explaining the science of tree surgery and giving ample evidence of its practical and permanent value to trees when properly practiced.

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Operating the Davey Institute of Tree Surgery.

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Correct Tree Filling as Done By "THE DAVEY METHOD"

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Canadian Forestry Journal

VOL. VII. OTTAWA, MAY-JUNE, 1911 No. 3

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Advertising rates on application.

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Ontario Government Nursery Station.

With the increasing gravity of the problem of dealing with the sand land areas in the older settled parts of the province of Ontario the importance of the Ontario Government Nursery Station increases. For a good many years the Government supplied from the nurseries connected with the Ontario Agricultural College at Guelph trees to farmers to restore their woodlots. More aggressive action was taken three years ago, when the Department of Agriculture purchased some farms in the sand lands area of Norfolk county, and Professor E. J. Zavitz, forester to the Department, was authorized to move the forest nurseries from Guelph to the new station at St. Williams, and to begin the planting of these farms with trees suited to the locality. The idea of the offi-

cers of the Department is that such a plantation would demonstrate to the farmers of Ontario how best to proceed with the reforestation of any such lands they may have on their farms, and also to demonstrate that the reforestation of considerable blocks of these lands can be profitably undertaken by municipalities or by individuals who are able to wait a considerable time for returns.

The village of St. Williams is ninety miles from Toronto, and the plantation is situated three miles from the village. The county of Norfolk is on the whole a most fertile one and one of the best in the province of Ontario. It is becoming famous as a great apple country, and cherries, plums, pears and even peaches are grown. It has, however, a number of sandy ridges, covering, all told, nearly ten thousand acres, and it is on these that the work of reforestation has begun. Starting three years ago with the purchase of three hundred acres the Department has now acquired a block of thirteen hundred acres of ridge land. Most of this has been cut over and the land farmed. Norfolk county was one of the earliest settled in the western peninsula of Ontario, and the farm which forms the centre of the Government's operations was settled in 1804. It was bought back by the Government in 1908 for $5 per acre. A picture of the homestead just after it had been abandoned is given herewith. (See page 61.)

A study of this district on the spot gives a different impression from that obtained from reading or even from pictures. The situation is both worse and better than it seems at a distance. It is better in that the good land reaches up so close to these ridges, and it is worse in that it has been bad farming (using that word in its broad sense) that has brought these ridges to their present condition, made them useless in themselves and dangerous as regards the good lands adjoining.

Blow sand held by Scots pine (Pinus sylvestris), planted in Spring of 1910.

Professor Zavitz has gone to work vigorously, and has already made a great change in the area. Two of the best farmhouses on adjoining farms having the largest amount of land suitable for nurseries have been improved and fitted up for the fore-

man and his assistant. Seedbeds and nursery rows have been set out, and some of the worst hills, those whose tops were blowing into the adjoining valleys and covering up the fairly good land there, have been planted out. These small trees, though planted in what seems a veritable sandbank without a blade of grass for acres, have done well, and, small as they are, have held the sand from blowing. Fields fairly level and available for nursery beds have been sown to rye, cow-peas, clover, etc., and the soil enriched by turning in the crop. The results have astonished some people in the neighborhood who never allowed anything in the nature of a crop to get up above the ground without taking it off.

Forestry Students planting Scots pine, Norfolk County Nursery Station.

There have been in the past considerable importations of seedling stock from Europe to the nursery station, but it is expected that within a few years all that is required can be produced in the nurseries here. It is from these nurseries that the 400,000 seedling trees per year which have been sent out free to Ontario farmers for planting have been shipped. While the party of students was at the nursery preparations were going forward to ship out the trees for this season, and these were shipped out in the following week. This quantity is very small when compared with the three millions per year shipped out from the Dominion Forestry Branch Nursery Station at Indian Head, Sask., but it must be remembered that much of the planting in Ontario is done with trees obtained from neighboring woods, and further that the number to be requested by the farmers of Ontario will undoubtedly increase very rapidly in the next few years. In fact up to the present the demand has kept pace with the facilities at the nursery station.

The trees so far set out in permanent location on the plantation include black locust (Robinia pseudacacia), jackpine, Scotch pine and white and red pine. Experiments are also being made with ash, walnut, oak and butternut. The first-named tree, black locust, seems to thrive best of all on these sand hills,

with jackpine and Scotch pine close seconds. Black locust has the power, like the clover and some other plants (legumes) of enriching the soil by reason of the colonies of bacteria which adhere to its roots. Outside of its use as timber it is thus useful as a culture plant. Black locust is a wood little known in Canada, but it is highly valued for work requiring firmness and toughness. Insulator pegs, vehicle and railway car timbers are made from it, and it makes the best of fence posts.

Although the plantation has been established for only three seasons there has been a notable change in the land in the plantation itself, and the effect is also beginning to be seen in the greater interest shown by timber owners in their timberlands. On the farm adjoining the nursery which belongs to a private citizen, there is a sawmill which has been running for about seventy years. Mr. Walter McCall, the owner, is understood to be desirous of keeping the mill going in perpetuity. He is the holder of a very considerable area of timberland in the district, which he is working on forestry lines with the idea of getting a perpetual supply. Mr. McCall met Dr. Fernow on this visit and told him that he had got his first ideas in this direction from some pamphlets which Dr. Fernow sent out about ten years ago. Mr. McCall is naturally much interested in the progress of the Government plantation. Others also are known to be interested, and as the experiment becomes more widely known its effect in regard to the care of private timberlands will be very great. Professor Zavitz has in the past given careful figures as to the cost of producing timber from plantations in southern Ontario, and from this time onward he will be able to show the actual results as well. The great problem of this feature of forestry in Canada is whether it will be undertaken by individuals or whether it must be undertaken by institutions like governments, federal and provincial, and municipalities, which never die. This has yet to be worked out, but the work of the Ontario Government plantation at St. Williams will undoubtedly advance the solution.

Dr. Fernow operating a seedling-planting machine, Norfolk County Nursery Station.

This year one of the classes of the Faculty of Forestry of the University of Toronto, under Dr. B. E. Fernow, Dean, and Dr. C. D. Howe, one of the lecturers, spent a week in the plantation and nurseries. The time of the students was divided between studying the tree types in the remaining stretches of forest, observing the work in the nursery, and in practical tests of planting, so as to acquire familiarity with the various tools used, and to arrive at a decision at first hand as to the best methods in the various soils.

The students spent a profitable week. This county is in the heart of the area that was covered with the hardwood forest of south-western Ontario, one of the best northern hardwood forests in the world. Dr. Fernow, of course, knew what trees to expect to find in the remaining stands, but he expressed himself as surprised at the proportion of the forest consisting of black gum (Nyssa silvatica), chestnut, hickory, walnut, and tulip (Liriodendron tulipifera). Specimens of practically all trees to be found in Canada, outside of British Columbia, are to be found here. The students thus, naturally, spent a good part of the time in the woods becoming acquainted with trees new to them, while the remainder of the period was spent in the plantations and nursery. A number of seed-beds were made and sown, and seedlings were transplanted into nursery rows. In the latter work a German planting machine was tested for the first time on this continent. With certain slight modifications it was believed it will do good work.

In the plantations a careful examination was made to see the proportion of successful trees of the various kinds set out, and then one day was given to planting 2,500 trees in a field partly covered with coarse grass and partly of blowing sand. The boys here for the first time became familiar with a lot of odd-looking tools, hoes, mattocks, spades and dibbles, which they had seen in the forestry museum at Toronto, but which some of them had not associated with practical work in this country. Each tool was tried by each of the students and at the end of the day they were most of them in favor of the broad mattock as the most rapid tool for large seedlings. Though the work by a lot of men, 'soft' from indoor work all winter, brought blisters and aching muscles they were convinced it was worth while, and it is likely for a number of reasons that the visit of forestry students to St. Williams will be a frequent one.

The Secretary of the Canadian Forestry Association spent three days at the plantation and on one of the evenings gave a talk to the boys on what he had seen in his trip to the United States.

Abandoned homestead on Ontario Government Nursery, Norfolk Co.
(See p. 58.)

FORESTRY TERMS.

Writers on the subject of forestry would do well to note the interrelation between four words which are often inaccurately used. Land covered by forest is 'deforested' when it is cleared; land that never grew a forest is 'afforested' when it is made to grow one; land that has been cleared of one forest is 'reforested' when it is made to produce another; and land that has been 'afforested' once is 'reafforested' when it is a second time planted. The term 'reafforested' is used very often when 'reforested' would be the correct word.

—Toronto Globe.

Dominion Forestry Work, 1911.

An Outline of the Work Projected by the Forestry Branch this Summer.

With the increasing number of trained men that is now becoming available through the institution of the forest schools of Canada, it has become possible for the Forestry Branch of the Department of the Interior to develop its work to a greater degree, and this season the number of men in its employ—temporarily, at least—shows a considerable increase. An outline of its work will be found of considerable interest.

Surveys.

Seven parties in all are engaged in survey work of various kinds.

Of these parties two will be engaged in a continuation of the work, commenced last year, of determining the eastern boundary of the Rocky Mountain forest reserve. Both of these parties are in general charge of Mr. G. H. Edgecombe, B. Sc. F. Going in by way of Edmonton, these parties started their operations at the line of the Grand Trunk Pacific railway, the 'northern' party working northward toward the northern limit of the reserve, the 'southern' party working southward to the 11th base line, (a point nearly due west of Lacombe, Alta.), up to which Mr. Caverhill located the boundary last season. The southern party is composed of Messrs. Geo. Tunstell, Wm. Kynoch, S. H. Clark and E. H. Finlayson, while in the northern party are Messrs. G. A. FitzRandolph, C. R. Mills and E. C. Manning.

A survey of the Porcupine Hills in Alberta is being made by a party with Mr. E. G. McDougall, B. Sc. F., at its head. These hills, while outside the boundary of the Rocky Mountain forest reserve, are reported to be well timbered, and the survey is being made with a view to ascertain whether they are suitable to be formed into a regular forest reserve. Mr. McDougall's assistants are Messrs. Roy L. Campbell, A. K. Shives, K. R. Machum and L. S. Newman.

Mr. H. C. Wallin, who has been with the Forestry Branch for several years, will continue the work of inspecting timber limits within the Railway Belt in British Columbia, with a view to ascertaining which of these are suitable for being thrown open to settlement as agricultural lands and which are permanently to be reserved for forest purposes. The great demand for land for farming within the British Columbia Railway Belt has made this work one of considerable importance. The examination of tracts suitable for reserves will also be carried on. Mr. Wallin's assistants will be Messrs. H. C. Kinghorn, B. Sc. F., a graduate of the Forest School of the University of New Brunswick, who will have charge of a separate party for part of the season; H. S. Irwin, R. McG. Watt, G. H. Prince and C. H. Morse.

Mr. D. Roy Cameron, B. Sc. F., will have charge of a reconnaissance survey of the timber in the vicinity of Lesser Slave Lake, and will have as assistants in the work Messrs. J. André Doucet (who was with Mr. Dickson's party last summer), R. G. Lewis and Fred. McVickar.

Mr. W. J. Vandusen will be the leader of a party which will work in the Porcupine mountains, in Saskatchewan. This party will survey the Porcupine mountains west of the present reserve, with the object of ascertaining how much, if any, of the land there should be permanently

reserved, and, if this work is finished in time, will then proceed to the Pasquia Hills, with a similar object in view. Mr. Vandusen's assistants will be Messrs. C. P. McAlister, D. Greig and H. B. Murray.

Mr. John W. Currie, B. Sc. F., of Andover, N.B., a graduate of the University of New Brunswick in forestry, will conduct an examination of the timber suitable for pulpwood on the Rock Gull lake and Trout lake watersheds, along the Kenesaga river and generally along any of the watersheds in Keewatin territory from which the wood can be 'driven' to Lac Seul, and will also report on the location and character of the waterpowers. Mr. Currie and his assistant, Mr. Moodie, will start in from Mattawa, the Hudson Bay post on the English river. Mr. Currie spent some time with the Riordon Paper Co.

Mr. F. W. Beard will complete the work of inspection along the line of the Hudson Bay Railway which was begun last summer by Mr. J. R. Dickson, and of which a report will very shortly be issued. (See article in this issue entitled 'Hudson Bay Railway'.) His route will lie down the Nelson river to its mouth, the work of inspection and cruising commencing at Split lake. The chief point of the inspection is to ascertain the general stand of timber throughout the district and what amount will be available for the construction of the railway. Mr. Beard is a graduate of the College of Forestry of the University of Minnesota, and has had experience in lumbering and forestry work, the former with the Prince Albert Lumber Co., the latter with the U. S. F. S. in Montana.

Mr. P. Z. Caverhill will this year be engaged in inspection work of fire ranging, especially along the lines of railway.

Mr. J. R. Dickson is engaged in technical work in the Riding Mountain forest reserve, where he will be engaged in work in connection with the formation of a plan of management for the reserve. Among the questions to be solved are the location of areas that should be cut, sites for saw-mills, etc.

The distribution of the temporary men according to the forest school attended is as follows:

University of Toronto — Third year, W. J. Vandusen (Toronto), Roy L. Campbell (Ottawa), R. G. Lewis (Toronto), E. H. Finlayson (Toronto), E. C. Manning (Toronto) and W. Kynoch (Toronto); second year, C. H. Morse (Toronto), G. Tunstell (Uxbridge, Ont.), C. R. Mills (Toronto), F. S. Newman (Merrickville, Ont.), R. McG. Watt (Toronto), C. P. McAlister (Toronto), A. K. Shives (Campbellton, N.B.) and H. S. Irwin (Toronto); first year, S. H. Clark (Cainsville, Ont.), D. Greig (Breakeyville, Que.) and F. McVickar (Toronto).

University of New Brunswick — Third year, G. A. FitzRandolph (Fredericton, N.B.) and G. H. Prince (Fredericton, N.B.); second year, H. B. Murray (Moncton, N.B.) and Kenneth R. Machum (St. John, N. B.)

DAWN IN THE FOREST.

Edith Willis Linn.

Like a grey nun across the eastern hills
The dawn creeps slowly, in her hand a star.
The forest stirs to greet her, faint and far
Pulses the music that the vastness fills.
In cloistered columns stands the pine that shrills
Beneath her breath, while like some gate ajar,
That shadows and the silences unbar,
The night swings backward as the new day wills.
Above the murmur of dim forest ways
Rises a paean—music's very own—
Clear as the pealing of a convent bell;—
So sad, so sweet—like love lost or outgrown;—
The forest-loving songsters' matin praise,
In silvery tones repeating, 'All is well.'

La Foresterie dans la Suisse.

Par G. Huffel, en Revue des Eaux et Forêts.

propos de son fonctionnement sont

L'enseignement forestier supérieur est donné en Suisse par une Ecole forestière annexée à la célèbre Ecole fédérale polytechnique de Zurich. La durée des études y est de trois ans. La première année, les élèves suivent des cours de physique, chimie, botanique, zoologie générale et forestière et de minéralogie, qui sont faits à leur usage par les professeurs spécialistes de ces matières à l'Ecole polytechnique.

La seconde année est occupée par des cours de 'Politique forestière' (Economie forestière), de Sylviculture, d'Aménagement, confiés à des forestiers de profession (MM. Felber, Engler et Decoppet) et des cours d'arpentage, construction de routes, de droit, de géologie de la Suisse, faits par des professeurs de l'Ecole polytechnique.

La troisième année est consacrée à la suite de la politique forestière, à la protection des forêts, à l'estimation en fonds et superficie et à quelques notions sur l'agriculture.

Les élèves sont* actuellement au nombre de 39 dans les trois années. Ce nombre paraît bien élevé si l'on songe que la Suisse ne compte que 188 agents forestiers. Les élèves diplômés qui sortent de l'Ecole n'ont aucun droit absolu à un emploi; ils doivent attendre qu'un poste vacant leur soit offert par un canton ou une commune. J'ai dit plus haut que la Confédération subventionne les cantons ou communes qui prennent à leur service des forestiers diplômés et qui leur consentent une rétribution minima fixée.

L'Ecole possède, comme le pays lui-même, une constitution démocratique, si je puis m'exprimer ainsi. Toutes les questions qui se posent à solutionnées par un Conseil formé du personnel enseignant et présidé par le 'professeur principal'. Celui-ci, désigné par le suffrage de ses collègues, est nommé pour deux ans et ne peut être réélu que deux fois de suite au plus.

Le canton de Zurich a adopté une nouvelle loi forestière. Cette loi, entre autres dispositions, règle à moitié la part que prendra dorénavant l'Etat aux frais d'aménagement des forêts communales ou corporatives. Des dispositions particulièrement intéressantes sont relatives aux forêts particulières. Pour éviter l'émiettement excessif de la propriété forestière, il est interdit de morceler des parcelles de moins de 50 ares. Les associations formées par des propriétaires privés pour la gestion en commun de leurs forêts sont favorisées de diverses manières. C'est ainsi qu'il suffit que la simple majorité des propriétaires forestiers d'une commune, possédant cependant en même temps la moitié au moins de la surface boisée, en soient d'avis pour que tous les propriétaires de forêts sur le territoire communal soient obligatoirement réunis en une association ou syndicat dans le sens de l'article 26 de la loi fédérale de 1902. Il existe déjà un grand nombre de ces associations dans le canton de Zurich. Elles entreprennent la création de pépinières, la construction des chemins, des travaux d'amélioration divers dans les forêts des associés. L'Etat accorde des subventions en argent qui vont jusqu'à 20% de la dépense pour tous ces travaux. Les bois des associés sont gérés gratuitement, d'après la loi fédérale, par les agents domaniaux.

L'article 29 de la loi zuricoise mé-

*1908.

rite une mention. Lorsque l'abatage d'une parcelle de forêt serait de nature à porter préjudice à une propriété voisine, le propriétaire de cette dernière est fondé à s'opposer à l'abatage et à exiger la conservation d'un rideau protecteur. Cette disposition est vivement critiquée par l'auteur de l'article de la Zeitschrift auquel j'emprunte ces détails. Il dit notamment: 'De pareilles prescriptions sont illusoires. Telle est l'opinion unanime de tous les agents forestiers expérimentés. En tous cas, les très faibles avantages, très rares et toujours précaires, qui peuvent en résulter, sont sans aucun rapport avec les frais et les tracas qu'elles occasionnent.'

Le canton de Berne a procédé récemment à la révision périodique des aménagements de ses forêts domaniales. Le rapport présenté par la Direction des Forêts au Grand Conseil à l'occasion de cette révision renferme un certain nombre de renseignements intéressants parmi lesquels je relève les suivants:

La contenance des forêts domaniales bernoises était de 10,062 hectares en 1865, de 10,646 en 1885 et de 12,499 en 1905. Leur valeur cadastrale a passé, dans ces quarante ans, de 9,300,000 francs à 15,400,000. L'accroissement provient non seulement de l'achat de friches ou de pâturages, mais aussi de l'acquisition de forêts productives, particulières ou communales. La Direction des forêts bernoise fait à ce propos une déclaration de principes qu'on ne saurait trop approuver: 'A mesure que les particuliers se détournent de la production de bois d'œuvre de fortes dimensions dans leurs forêts, il devient plus nécessaire de poursuivre cette production dans les forêts publiques. Il est tout particulièrement du devoir de l'Etat de veiller à ce que le gros bois ne fassent pas défaut au marché...' Les 12,500 hectares de forêts domaniales bernoises ont produit en moyenne, de 1895 à 1905, 641,000 mètres cubes de bois et 10,500,000 francs, soit 16 fr. 35 par mètre cube (de bois débité aux frais de l'Etat et rendu sur le bord des chemins). Ce prix n'était que de 12.75 pendant le décennie 1865-1875 et de 13.25 pendant celui de 1885-1895.

La Suisse est de plus en plus un pays importateur de bois. Le tableau plus bas résume le commerce extérieur spécial en produits forestiers pendant l'année 1906. On voit que, bien que le taux de boisement de la Suisse soit assez élève (1) et que les

(1) La Suisse possède, en dehors de prés-bois, 856,000 hectares de forêts, ce qui représente 20.6% de la surface total et 27.7% de la surface productive. 4.6% des forêts appartiennent aux Etats (cantons), 66.9% aux communes ou corporations et 28.5% aux particuliers. L'epicea forme 40% des forêts, le hêtre 25% et le sapin environ 20%.

Catégories de Marchandises.	Importations en Suisse.		Exportations de Suisse.	
	1000 kilogr.	1000 francs.	1000 kilogr.	1000 francs.
Bois de feu et charbon de bois	1,684	4,920	236	575
Ecorces à tan	92	852	3	31
Grumes de feuillus	193	1,438	66	575
Grumes de résineux	482	2,871	158	582
Sciages — Chêne	158	2,954	1	12
Sciages — Feuillus divers	109	1,264	16	184
Sciages — Résineux	1,094	11,454	70	765
Placages	4	759	0.5	43
Cellulose, pâte de bois	76	1,636	63	1,790

forêts soient peuplées de résineux sur plus des deux tiers de leur étendue, ce pays importe annuellement pour onze millions de francs de sciages résineux dont les trois quarts lui proviennent d'Autriche-Hongrie. Les sciages du chêne importés, dont la valeur atteint trois millions de francs, proviennent pour les deux tiers de la même origine, et de France pour un cinquième.

TORONTO FOREST STUDENTS.

Forty-five students wrote on the examinations of the Faculty of Forestry of the University of Toronto. Some of these had to complete some Arts examinations toward the end of May, but forty of them had found employment for the summer by the time the trip to Norfolk closed. Of these twenty were engaged by the Dominion Government Forestry Branch, sixteen by private companies, three as fire-rangers, and one in horticultural work. The places from which the students came were widely scattered. Nineteen were from the city of Toronto, fourteen from other parts of Ontario, two from Nova Scotia, three from New Brunswick, two from Quebec, one from Alberta, one from British Columbia, and three from the United States. There were six graduates, whose pictures will be found in another column. They are (reading from the top of the picture downward) D. R. Cameron, E. G. McDougall, L. M. Ellis, J. D. Gilmour, A. Joly de Lotbinière, and S. S. Sadler. The first four are Ontario men, Mr. Gilmour being also a graduate of the Ontario Agricultural College; Mr. Joly de Lotbinière is from Quebec; and Mr. Sadler is from the United States.

In reporting to the Superintendent of Forestry, Mr. Geo. Douglas, forest ranger in the Battleford district, reports having found, north of Bright Sand lake, a whole swamp of tamarack trees defoliated by the Larch Sawfly (Nematus Erichsonii).

1911 Graduates in Forestry, University of Toronto.

The New Forest Reserves Act.

Forest Reserves and National Parks to be Administered by Director of Forestry.

The present session of Parliament has seen the passage of a new Dominion Forest Reserves and Parks Act, to which the royal assent was given on May 19th. As may be inferred from the title, the scope of this bill is broader than the Forest Reserves Act of 1906, and by it are superseded both the Forest Reserves Act of 1906 and the Rocky Mountains Park Act.

In the new bill the first six sections of the original Forest Reserves Act are left practically unaltered. These relate to the withdrawal of lands from sale and occupancy for the purpose of creating forest reserves, the constituting of forest reserves and the provision for their control by the Director* of Forestry, authorizing the appointment of forest rangers and granting them the powers of a Justice of the Peace and providing for the ranger's oath.

Section seven gives the Governor-in-Council power to purchase and expropriate (under the Expropriation Act) land within a reserve which is not the property of the crown. Exchange was formerly the only method of dealing with such lands.

The rights of holders of leases and licences within reserves are specifically protected. Denuded timberlands may be withdrawn from such leased or licensed areas by the Government, upon notice being given the holder of the licence or lease.

It is enacted that railway companies must pay one-half the cost of fire patrol along their lines under construction, and rangers, when on duty on such patrol, are to be carried free.

Rangers are given summary power to arrest and bring before a magistrate, or to remove from the reserve, any offenders against the Act. They may seize, in any place, any timber cut within the reserve or removed therefrom, any minerals removed and any game taken or killed within the reserve, and, within the reserve, may confiscate firearms, fishing tackle, etc., unlawfully there. The rangers are given the right of search of buildings, etc., in the reserve and within ten miles of its boundaries.

Lands may be withdrawn from the reserve for railway purposes.

The powers of the Governor-in-Council to make regulations for reserves and parks are defined.

The Governor-in-Council is given power to designate, by proclamation, areas for parks and to make regulations for their management.

Reserves and Their Areas.

British Columbia—

Among the British Columbia reserves the Long Lake, Monte Hills, Martin Mountain, Niskonlith, Tranquille, Hat Creek and Larch Hills reserves are left unchanged. The Donald forest reserve is abolished, and the Yoho Park and Glacier National Park are brought under the Act.

Manitoba—

In Manitoba the Riding Mountain, Turtle Mountain and Porcupine reserves are left unchanged. The Lake Manitoba West reserve is dropped. The Spruce Woods reserve is doubled, being increased in area from 110 square miles to 224.5 square miles. An addition of 153 square miles is made to the Duck Mountain reserve, making its total area 1,401 square miles. As this reserve has

*The title of the chief officer of the Forestry Branch is changed from Superintendent to Director of Forestry.

been extended into Saskatchewan, the same plan has been adopted in designating it as was taken with the Porcupine reserves; that is, the part of the reserve within the province of Manitoba is known as Duck Mountain reserve No. 1, while that in Saskatchewan is called Duck Mountain reserve No. 2.

Saskatchewan—

In Saskatchewan Porcupine reserve No. 2 is unchanged. Moose Mountain Forest Reserve is diminished by seven square miles, while The Pines forest reserve has nine square miles added to its area. The Beaver Hills reserve is increased by twenty-seven square miles.

Three new reserves have been created, namely, Duck Mountain No. 2, Cypress Hills No. 2 and Nisbet forest reserves. Duck Mountain Reserve No. 2 has an area of eighty-one square miles; it is contiguous with Duck Mountain Reserve No. 1. The Cypress Hill Reserve No. 2 is continguous with Cypress Hills reserve No. 1 as established under this Act; it is seventy-two square miles in area. The Nisbet forest reserve is directly across the river from Prince Albert; its area is 15 square miles.

Alberta—

The Cooking Lake reserve in Alberta is enlarged from 111.5 square miles to 114, and the Cypress Hills reserve from eighteen to eighty-one. The latter reserve is now known as Cypress Hills reserve No. 1 (for the same reason as in the case of the Porcupine and Duck Mountain reserves), and Cypress Hills reserve No. 2 is contiguous with it in Saskatchewan.

The largest reserve of all (first set aside by order in council in May, 1910, and referred to in the June, 1910, issue of the *Journal*) is the Rocky Mountain forest reserve. The area, as defined in the Act, is 18,213 square miles. This, of course, includes Rocky Mountain (Banff) Park, Jasper Forest Park and the Waterton Lakes Park.

Buffalo Park, near Wainwright, Alta., is also set aside, 159 square miles in area.

The aggregate area of the reserves and parks is now 25,186½ square miles, as compared with 16,312¼ square miles formerly. The increase in Manitoba is nine and a half square miles, the area now under reserve being 3,584¾ square miles, as compared with the previous area 3,575¼ square miles. With the present area of 937 square miles under reserve, the Saskatchewan reserves have increased by 197 square miles over the former area of 740 square miles. Alberta's reserves have well nigh doubled in area, being now 18,564½ square miles as compared with 9,702, an increase of 8,862½ square miles. In British Columbia alone has the area under reserve been lessened. In that province the former reserved area was 2,295 square miles; the area reserved is now 2,115¼ square miles, thus showing a decrease of 179¾ square miles.

TREE PLANTING IN NEW BRUNSWICK.

A despatch from Moncton, N.B., to the St. John Telegraph reads:

Prof. R. B. Miller, head of the forestry department in the University of New Brunswick, is here superintending the planting of pine seedlings on a block of land owned by Dr. A. R. Myers about twelve miles from Moncton. In all some 45,000 transplants will be put in, covering a territory of about twenty-five acres. This is the first planting of white pine done in New Brunswick or in the maritime provinces.

Prof. Miller estimates in thirty or thirty-five years, white pine transplants will be good sized lumber. Dr. Myers, who is the first to introduce the restoring of the forests in New Brunswick, has secured a quantity of white pine seed and intends raising transplants of his own, thereby effecting a great saving. Prof. Miller is growing white pine seedlings at the University of New Brunswick, Fredericton, and expects to have some ready for distribution within a year or two.

It was Prof. Miller's intention to have a camp of students here to do the planting, but examinations interfered.

New Brunswick's Legislation.

Prohibiting the Export of Unmanufactured Pulpwood from Canada.

On April 13th last the bill prohibiting the export of pulpwood cut on crown lands was passed by the New Brunswick legislature. It provides that 'all sales of timber licenses' giving the right to cut 'spruce or other soft wood trees or timber, other than pine and poplar' and 'all licenses or permits to cut such timber' shall be 'subject to the conditions set forth in Schedule A' of the Act, which may be cited as 'The Manufacturing Condition.'

Schedule A, referred to, provides that 'every timber license or permit conferring authority to cut spruce or other soft wood trees or timber, not being pine or poplar, suitable for manufacturing pulp or paper, on the ungranted lands of the Crown shall contain and be subject to the condition that all such timber cut under the authority or permission of such license or permit shall be manufactured in Canada, that is to say, into merchantable pulp and paper, or into sawn lumber, woodenware, utensils or other articles of commerce or merchandise as distinguished from the said spruce or other timber in its raw or unmanufactured state.'

If this condition is not observed, the license is to be suspended. The Surveyor General is given power to seize any timber which the owner is suspected to have the design of removing from the country, and retain it until the owner satisfies him that it is not the intention so to remove it.

The Act fixes the fee for the transfer of licenses at four dollars per square mile.

The provisions of the Act prohibiting the exportation of pulpwood are not to come into force until the 1st of October next.

Hudson Bay Railway.

Report as to Timber along Proposed Route not very Optimistic.

'There is probably enough timber available to build the rough construction work of the Hudson Bay Railway.'

During the summer of 1910 the Forestry Branch of the Department of the Interior had a party exploring along a portion of the proposed route of the Hudson Bay Railway, and in the words just quoted the head of the party (Mr. J. R. Dickson, B.S.F., Asst. Inspector of Forest Reserves) in his report, just published, gives his impression of the timber of that part of the country.

The Country Traversed.

The party started at The Pas and covered some eight thousand square miles. Their explorations included the country around Mitishto lake, the Mitishto river, the Grass river system, with its numerous lake expansions (including Wekusko lake), Pakwa (or Pakwahigan) lake, Setting and Split lakes and the Nelson river system, including Cross and

Sipiwesk lakes, Wintering and Landing lakes, return being made by way of the Minago (or Pine) river. The district inspected covered some 235 miles of the line of the proposed railway.

Method of Survey.

The method followed was to run inspection lines at three to six mile intervals. The men worked singly, running the lines by compass, and were able to travel from four to six miles per day and return to the line. In this way a rapid reconnaisance was made, which was extended by the use of field-glasses.

Timber of the Region.

Through the country covered by the exploration no timber was found at any considerable distance back from the water. 'Only a mere fraction of one per cent. of the area surveyed now carries merchantable timber,' the report says.

Spruce is, for the most part, the only timber there which is large enough for saw-timber or railway ties. The poplar, birch and jack pine are too short, spindly, limby and crooked for anything but fuel and pulpwood. Practically all the tamarack has been killed by insects; 'we did not find two hundred green tamarack above ten inches in diameter all summer,' writes Mr. Dickson.

The total number of ties available in the district traversed is estimated at some 360,000; the saw-timber totals about nine and a half million feet. For pile timber dead tamarack and the largest of the close-grained black spruce could be used. The possible supply of fuelwood is enormous. There will also be a large supply of pulpwood, but much of the timber is as yet too small even for pulping.

Rate of Growth of Trees.

The rate of growth, as far as observed, is generally decidedly slow. Black spruce takes, on the average, one hundred years to attain a diameter of four to five inches, and in the same period white spruce grows to a diameter of eight to twelve inches, and poplar to eight to ten inches. 'I saw no jack pine stand where the trees averaged even six inches in diameter,' the author of the report says. The slow rates of growth are largely due to the cold wet soil of the undrained muskegs which cover so much of the district.

Danger from Fire and Insects.

'The fire loss and danger is appalling,' to use Mr. Dickson's words. Two great fires have occurred, approximately forty and eighty years ago, respectively, and practically every corner of the region has been burned over by these. Instances were frequently noted where these fires had evidently leaped lakes over a mile in width. Fires frequently live in dry moss all winter and break out again in spring.

The work of the fires is supplemented by that of the bark beetles. Not only have these insects killed practically all the tamarack but they are now at work destroying the scattered patches of mature spruce. When the beetles have finished their work and killed the trees, a strong wind overthrows these. Finally lightning sets fire to the tangle of debris resulting, and fire starts and may run over mile after mile of the country.

The report makes a number of suggestions for the better protection of the region from fire; but the district is extensive and practically uninhabited, so that if a fire starts the chances of controlling it, even with a good ranger system, are not at all certain. An interesting point to note is that the Indians of the region are much more careful with fire than the white men.

Brief remarks of much interest are made with regard to the topography, soil, vegetation and climate of the region, its mineral resources, fisheries, game and fur animals and other topics.

Railway Act Amendments.

Compulsory Fire Ranging Provided for and Damage to Forests Recognized.

During the present session of Parliament a couple of amendments of importance to the forestry interests of the Dominion have been made to the Railway Act.

By an amendment to section 30, paragraph 'f,' subsection 1, the Board of Railway Commissioners are given power to require any railway company 'to establish and maintain an efficient and competent staff of fire-rangers, equipped with such appliances for fighting, or preventing fires from spreading, as the Board may deem proper, and to provide such rangers with proper and suitable equipment to enable them to move from place to place along the line of railway with all due speed.' The Board may also require the company 'to maintain an efficient patrol of the line of railway and other lands in the vicinity thereof to which fires may spread, and generally define the duties of the company, and the said fire-rangers, in respect thereof.' 'The Board may require the company,' the clause continues, 'to make returns of the names of fire-rangers in its employ in the performance of the above-named duties and of the places or areas in which they are from time to time engaged. For the purpose of fighting and extinguishing fires, the said fire-rangers may follow the fires which spread from the railway to, over and upon the lands to which they may spread.'

Another amendment of much importance is the rendering of the railway company liable for damage to 'any property,' instead of merely for 'crops, lands, fences, plantations or buildings and their contents,' by which amendment timber lands are clearly brought among those things for damage to which the company is liable.

1911 TREE DISTRIBUTION FROM INDIAN HEAD.

About the usual number of trees has been distributed from the nursery at Indian Head, Sask. The distribution of coniferous stock has been continued.

Mr. A. Mitchell, Asst. Chief of the Tree Planting Division, has resigned, and his place has been filled temporarily by Mr. S. S. Sadler, who has just completed his fourth year's work in the Faculty of Forestry of the University of Toronto. Mr. Mitchell will take up commercial nursery work in Lethbridge, Alta.

There will this year be eight inspectors of tree planting; these are Messrs. A. P. Stevenson, of Dunston, Man., John Caldwell, of Virden, Man., Angus Mackintosh, of Headlands, Sask., and Walter B. Guiton, Jas. Kay, J. N. B. MacDonald, Wm. Macdonald and Jas. Cowie, of Indian Head, Sask.

After the present year it has been decided to have the applicant for trees pay the express charges thereon when received. A charge of $1.00 per hundred for conifer seedlings will be made, and not more than 500 of these will be given to any one applicant.

IN THE YEAR 2011.

Woggs—The Richleighs are very lavish entertainers.

Boggs—Yes. At the close of their banquet last evening each guest was presented with a solid wooden toothpick.

—Puck.

The only Canadian Species of Alligator.

THE CANADIAN 'ALLIGATOR.'

—

The accompanying illustration shows an 'alligator,' or warping tug, a device which has been used with considerable success in districts in which are found many small lakes connected by streams of no great size.

The 'alligator' is essentially a flat-bottomed scow, fitted with engines and paddle-wheels or a propeller. The latest type has twin screws, the shafts of which have a flexible joint, so that the screw can be raised up so as to escape obstructions. A steam winch is also installed on board, and the engine can be thrown in gear to drive either the propeller or the winch.

To the bottom of the boat is attached a pair of runners, shod with iron, and the bow and part of the bottom are covered with steel boiler plate.

When it is necessary to make a portage, a cable is attached to the bow of the boat and then run to a tree or trees along the road and fastened there. The engine is then geared on the winch and the cable is hauled in. The boat thus crawls over the land, thus by its amphibiousness justifying its name of 'alligator.' Quite a number of these tugs are now in use and are claimed to be giving good satisfaction.

Forest Statistics of Canada for 1909.

Results of Work of Dominion Forestry Branch Synopsized.

The statistics of the lumber cut of Canada for 1909, lately published by the Forestry Branch of the Department of the Interior, show a total cut of 3,814,942,000 feet, board measure, an increase over the cut for 1908 of almost fourteen per cent. The value of the 1909 cut was $62,819,477. The number of mills from which figures were received was 2,085, as compared with 1,409 in 1908.

The province of Ontario easily leads in the production of lumber, one-third of the total cut coming from this province. British Columbia goes up to second place, and Quebec drops to third. The other provinces occupy the same rank as in 1908, the order in point of production being as follows:—New Brunswick, Nova Scotia, Saskatchewan, Manitoba, Alberta, Prince Edward Island.

Of the different species the largest cut was that of spruce, namely 1,124,949,000 ft., nearly one-third of the whole. White pine was next, with 1,046,783,000 feet. Spruce and white pine thus make up nearly three-fifths of the entire cut. Douglas fir is in third place, 469,658,000 feet of that timber having been cut, an increase of over twenty-six per cent. over the 1908 cut. Hemlock takes fourth place with a cut of 302,721,000 feet, and cedar fifth with 189,391,000 feet; the latter shows an increase of fifty-four per cent. Woods whose cut show extraordinary increases over the cut of 1908 are beech, with an increase of 196 per cent., basswood, the production of which increased 188 per cent., tamarack, with an increase of 92 per cent., balsam, which shows an increase of 88 per cent., and ash, with an increase of 62 per cent.

The difference between the production of softwoods and that of hardwoods is striking. Over ninety-four per cent. of the total quantity of wood cut in Canada was softwood, and less than six per cent. of the cut was composed of hardwood lumber. The remainder of the supply of hardwood has, of course, to be imported, chiefly from the United States. Among the hardwoods produced in Canada birch takes the first place, with maple second.

Of the spruce cut, nearly one-third of the total was obtained from Quebec, but spruce of one species or another was cut in all the nine provinces of the Dominion —a statement that can be made of no other tree. In almost all provinces the cut of spruce showed an increase.

Ontario is still far ahead of all the other provinces in the production of white pine, almost eighty-five per cent. of the entire cut being produced in that province. Nova Scotia, New Brunswick and British Columbia all greatly increased their cut of this timber in 1909 over that of 1908, while Quebec shows a decrease of fifty-seven per cent.

Douglas fir is cut almost exclusively in British Columbia, and shows a marked increase, though the cut is still small as compared with that in Oregon and Washington.

Square Timber.

The total value of the square timber exported is less than a million dollars, namely, $991,491, the total quantity exported being 41,442 tons. Between 1871 and 1880, when the trade in square timber for export was at its height, the quantity exported averaged 491,117 tons, and the average annual value, despite the smaller prices then prevailing, was over five times the value in 1909, namely $5,139,111.

Laths.

Of laths there were made 822,124,000, an increase over 1908 of over 150,000,000. Ontario leads in this line of manufacture with thirty-five per cent. of the total, New Brunswick has second place, followed by Quebec, Prince Edward Island and British Columbia in the order named. Spruce and white pine are the leading woods used for this manufacture, cedar and Douglas fir coming next, but far behind.

Shingles.

In the manufacture of shingles British Columbia has an easy lead over the other provinces, making forty-three per cent. of the product. Quebec comes next and Prince Edward Island third, followed, in the order given, by New Brunswick, Ontario, and Nova Scotia. The cut in the other three western provinces is very small.

Seventy-five per cent. of the total number of shingles are made of cedar, and fifteen per cent. of spruce. White pine furnishes about seven per cent. of the shingles used, but no other wood produces even one per cent. of the total.

Pulpwood.

There were 622,129 cords of pulpwood used in Canada during 1909. Of this the total value at the mill was $3,464,080. In spite of a decline in the price of pulp-

wood the value of the wood consumed increased more than $530,000 over that used in 1908, the quantity used in 1909 being nearly thirty per cent. in advance of that used the previous year.

There are some sixty pulp mills in the Dominion, and of these reports were received from fifty. Half of these mills are in Quebec, one-fifth in Ontario, and the rest are located in New Brunswick, Nova Scotia and British Columbia.

The province of Quebec furnished over half the pulpwood, Ontario gave about one-third, while the remainder was distributed over New Brunswick, Nova Scotia and British Columbia.

Two species of timber, namely, spruce and balsam, furnished ninety-nine per cent. of the wood used in the making of pulp, spruce furnishing eighty-seven per cent. and balsam twelve per cent. Poplar, hemlock and jack pine were also used.

Three-fifths of the pulpwood cut in Canada during 1909 was exported to the United States for manufacture. Nearly all this wood went from Quebec. The average price received for it was only forty-five cents per cord more than was paid at the Quebec mills.

The pulpwood shipped from Canada in 1909 furnished 46 4/10 per cent. of the raw material used by the ninety pulp mills of the state of New York and an appreciable portion of that used by the paper mills of New England and Pennsylvania. The manufacture of the pulpwood exported in 1909 kept sixty-nine out of the two hundred and fifty-one pulp mills of the United States running at full capacity for the year. Had it been manufactured in Quebec, it would have kept running seventy-one mills of the same capacity as those now running in Quebec.

Cross-ties.

The steam and electric railways of Canada purchased, during 1909, 14,178,241 crossties, which cost them, at the point of purchase, $5,210,409. Almost three-tenths of these ties were of cedar, about one-fourth were of jack-pine, and other woods furnished the following percentages of the total: tamarack, twenty (20) per cent.; hemlock, thirteen (13) per cent.; spruce, six (6) per cent., and Douglas fir five (5) per cent. White pine, chestnut, oak, cypress, red pine and southern pine are used only to a very limited extent. The average price of all ties used in 1909 was 37 cents each. The price of ties of different species was as follows: cedar, 45 cents; tamarack, 39 cents; hemlock, 33 cents; jackpine, 30 cents, and spruce, 25 cents each.

Steam roads used over ninety-nine (99) per cent. of these ties.

The average length of life of ties of the different species was found to be as follows: cedar, nine years; tamarack, eight years; hemlock, seven years; Douglas fir, seven years; jackpine, six years, and spruce, six years.

Poles.

During the year (1909) 358,255 poles were purchased by the telegraph, telephone and electric light and power companies and the steam and electric railways. Of these the total value at the point of purchase was $497,052. The purchases of poles in 1909 were almost double those in 1908 (193 per cent.) and the average price per pole fell from $1.53 in 1908 to $1.39 in 1909. These differences were due to an increase in the purchase of short cedar poles by the telegraph and telephone companies.

Of the total number of poles ninety-four (94) per cent. were of cedar. Tamarack furnished four per cent., and spruce and Douglas fir the remaining two per cent.

Telegraph and telephone companies used eighty-three (83) per cent. of the poles used, steam railways twelve per cent. and electric companies the remaining five per cent.

The figures given above have been published by the Forestry Branch as Bulletins Nos. 11, 12, 13 and 14, copies of which may be obtained from R. H. Campbell, Superintendent of Forestry, Ottawa.

Cooperage.

The cooperage industry is divided into two distinct branches, namely the manufacture of tight cooperage (barrels for the containing of liquids) and the manufacture of slack cooperage (barrels for holding flour, apples and other such non-liquid products).

The total value of the cooperage stock manufactured in Canada during the year was $1,842,235. Information was received from 128 firms throughout the Dominion.

The tight cooperage industry in Canada is relatively unimportant. The value of the stock manufactured amounted to only $247,116, or 13.4 per cent. of the total. Owing to the fact that there is now left in Canadian forests no oak (the only wood yet found suitable for the manufacture of high-grade tight cooperage), the chief users of tight cooperage stock (i.e., shippers of whiskey, beer, ale, wines and oils) import from the United States either their barrels, staves and heading already manufactured, or else the logs from which to make this stock.

The value of the products of the slack cooperage industry amounts to $1,595,119. In this industry elm is used far more than any other sort of wood; almost two-thirds of the staves, over one-quarter of the headings and some five-sixths of the hoops produced were made of this wood.

Spruce furnished one-sixth of the staves, about one-fifth of the headings, and somewhat less than four per cent. of the hoops. Poplar furnished the largest proportion of the headings used—thirty-one per cent., or almost one-third—but little more than six per cent. of the staves. Other woods used are maple, basswood, ash, cottonwood, balsam, birch and beech. On the whole, considered on a per capita basis, the annual slack cooperage output of Canada is greater and more valuable than that of the United States.

Slack cooperage can profitably be manufactured from sawmill waste, and this method of manufacture is being introduced into the United States. It will no doubt come into favor in Canada also.

Boxes and Box Shooks.

The quantity of lumber used in the manufacture of boxes and box shooks for the year was 82,972,000 feet, valued at $1,264,376, an average value of $15.24 per thousand feet. These figures represent only the product of the regular box manufacturers. Manufacturers in many lines, e.g., furniture, stoves and pianos and organs, make their own crates and packages. Three-quarters of the consumption of lumber for this purpose is reported from Ontario and Quebec, where the lumber used was valued at over $15 per thousand. A comparatively small proportion of the manufacturers in this line have reported, and it is probable that a consumption of 140,000,000 feet of lumber, valued at $2,100,000 would be nearer the actual total of wood used. The manufacture of boxes is one of the industries where a low grade of lumber, which could be profitably obtained from mill waste, could be utilized, to a far greater extent than at present. At present, in Quebec and British Columbia, box lumber commands a higher price than all other lumber, and in Nova Scotia the spruce used for boxes almost equals in price the spruce of all grades in the market.

Spruce furnishes over one-half the wood used for boxes, and pine about thirty per cent. Basswood gives about four per cent., the other thirteen woods used vary from three per cent. to a fraction of one per cent.

Tan Bark and Tannins.

Sixty-seven tanneries report the total value of the vegetable tanning materials used at $1,126,004; this probably represents about ninety per cent. of the total consumption. The total was comprised of 76,792 cords of bark, valued at $646,679, 17,313,500 pounds of liquid extract, valued at $428,283, and 1,372,470 pounds of raw vegetable tannins, valued at $51,042.

Hemlock is now the only bark used in Canada for tanning, and few tanneries depend upon it altogether; most of the tanneries use bark for some processes and various other tannins for other processes.

Ontario, with thirty-six tanneries reporting, used 66.7 per cent. of the vegetable tannins, Quebec consumed 23.6 per cent., Nova Scotia reported the consumption of six and a half per cent. of the whole, and New Brunswick about half the latter amount.

The average price per cord, at the tannery, of the bark used is $8.42 per cord, and of the liquid extract two and a half cents per pound.

Bulletins 11, 12, 13, 14, 19 and 20 of the Forestry Branch of the Department of the Interior, from which the above figures are taken, deal much more in detail with the topics mentioned, being devoted, respectively, to (11) lumber, square timber, lath and shingles, (12) pulpwood, (13) cross-ties, (14) poles, (19) cooperage and boxes, and (20) tanbark and tanning materials. Bulletin No. 15, which will be published in both English and French, will consist of a collection of the above bulletins. Copies of any of these may be obtained on application to the Director of Forestry, Ottawa, Ont.

Forest Fires of May and June, 1911.

The long continued dry weather during the months of April and May gave rise to conditions very favorable to fires in the forests, and from east to west come reports of forest fires, especially during the early part of May.

Ontario.

For several days during the first third of the month grave apprehension was felt at Kenora and Fort Frances, in the extreme west of the province. The fires in the neighborhood of Kenora began about the fifth of May, the worst being at Clearwater and Whitefish Bays.

In towns along the Canadian Northern Railway much apprehension was felt, though little damage seems to have been done north of the International boundary. Near Rainy River some damage was done.

The older settled parts of the province did not escape. The neighborhood of Lanark, Ont., was visited by quite a severe fire, which resulted in some $5,000 damage. Near Bala, Muskoka, a settler allowed a brush fire to get beyond con-

trol during a high wind, resulting in some damage and fires raging around Lavant station, seventy miles north of Kingston, on the K. and P. Ry., resulted in the inhabitants sending to Kingston for assistance from the fire department, which was promptly sent.

In the vicinity of Carleton Place, in the latter half of the second week of the month, a number of farmers lost buildings, etc., to the value of ten thousand dollars A hamlet called Lake St. Peter, near Maynooth, in the northern part of Hastings county, was destroyed by fire on May 13, during a fierce gale. Thirty people were rendered homeless, only the schoolhouse, a boarding house and one residence being left. The Rathbun company lost all their plant. Minor fires are reported from other parts of the province.

Eastern Canada.

During the first week of the month some ten thousand dollars damage was done by forest fires near Mahone Bay, Nova Scotia. Near Parrsborough, on Mines Bay, a large tract of timber was burned over, and some damage done at the village of Hubbards, Halifax county. During the last two or three days of the month considerable damage was done near Shelburne, N.S. Two fires raged in the vicinity and thousands of dollars worth of property was destroyed, including several residences in a couple of villages.

In New Brunswick for a time the situation seemed serious.

About the middle of the month a tract of timberland eight miles long, with a breadth varying from half a mile to four miles, was burned over in King's county, and in York county the fire rangers of the provincial government were kept busy. Within a mile of Moncton a forest fire burned over five hundred acres and kept a couple of hundred men busy for a time. In Carleton county fire was reported to have overrun a tract ten miles long in one direction and five miles in another, with a width of a mile. The fires throughout the province were mostly confined to old burned land, very little green timber having been destroyed.

Near Buckingham, Que., on May 13th, a bush fire consumed all the buildings connected with a graphite mine, and burned over 1,100 acres of timberland belonging to the same concern, thereby causing a total loss of over $50,000. Near Megantic, Que., a day or two before, a tract of timber land said to be four or five miles square was burned over. Serious fires are also reported from the more heavily timbered parts of the province.

Manitoba.

About May 5th severe fires started in the country north of Dauphin, along the Canadian Northern Railway. Between Bowsman and Barrow's Junction six bridges were burned, and traffic on the railway interrupted for several days. Owing to the burning of many poles telegraphic communication was interfered with for some time. The worst fires were in the neighborhood of Mafeking.

In the Riding Mountain district, also, fires started up, and a number of settlers in the district, chiefly Galicians, were burned out. The flames, however, were checked before getting into really valuable timber, though a large quantity of young growth was consumed. The fire is said to have covered a range of country fully two hundred miles in extent. Quantities of timber, cut by portable mills during the winter for settlers' use, as well as some belonging to commercial firms, were destroyed. Near Kelwood one sawmill was burned. Five gangs of men, under Chief Fire Ranger McLeod, were fighting the fires, and, aided by heavy rain on the afternoon of May 9th, finally got the flames under control.

In the Duck Mountains, also, a large fire raged near Birch river, but it was, after hard fighting, brought under control. Near Swan river, also, heavy fires were reported.

Saskatchewan.

Prince Albert advices of May 6th reported forest fires threatening Big River village and the mills there. The fire had been burning for two days and had reached within three-quarters of a mile of the place. A special train was sent out to bring the people in, and the city of Prince Albert sent a fire engine and several men. The fire fighters, under the direction of A. L. Robertson, Dominion Forest Fire Ranger, got the fire under control, aided by a change of wind.

On the afternoon of May 7th a forest fire approached to about six miles from the city of Prince Albert, but a fortunate change of wind saved the place from any danger.

Alberta.

No serious fires have been reported from Alberta this season.

British Columbia.

Nelson despatches of May 3rd report a fierce bush fire burning near Kaslo, supposed to have started from settlers clearing land. Arrowhead was also threatened by a fire, and some of the inhabitants packed up their belongings preparatory to moving. Considerable damage was done to heavy timber by the fire. Some small fires occurred in the Railway Belt, but no damage of importance resulted.

United States.

The first forest fire of the year in the Lake States was reported on March 18,

near Brainerd, Minn., when the house and stable of a settler were destroyed.

The last week of April saw some fierce fires in Massachusetts and New York states. By April 27, 5,500 acres were reported to have been burned over in the neighborhood of North Adams, Mass., though there was little danger occasioned to settlements. A day or two later a forest fire in the Catskill mountains, in New York state, said to have been caused by a spark from a locomotive, threatened Lake Mohonk, the scene of the peace conferences, and the village of Lloyd, in the Shawangunk mountains, was threatened by fire.

In the first week of May, also, a large number of minor forest fires were reported throughout New England. Two lives are reported to have been lost.

About May 7th northwestern Minnesota reported a large number of fires. The neighborhoods of Duluth, Virginia and Hibbing were especially visited. Northern Wisconsin was similarly affected.

In Michigan, about the same time, fires were reported from Houghton, Ontonagon, Keweenawa and Baraga counties, but no serious damage to forests was occasioned. West of Calumet, on Lake Superior, fires were also reported in timbered country.

The most serious damage seems to have been done in West Virginia. Despatches of May 15th reported that fires had already caused a loss of $1,000,000 and were still burning. The fires extended through the mountains for a distance of two hundred miles. One man dropped dead while fighting fire, and another was burned to death while fighting fire which spread from a brush fire that he himself had started.

FORESTRY BRANCH PUBLICATIONS.

The following is a list of the publications of the Forestry Branch of the Department of the Interior, which are either now ready for distribution or will shortly be published:

Annual Reports: Superintendent of Forestry—1904 and following years.

Bulletin 1. Tree-Planting on the Prairies—N. M. Ross.

Bulletin 2. Planting and Care of a Forest of Evergreens—A. Knechtel.

Bulletin 3. Dominion Forest Reserves—A. Knechtel.

Bulletin 4. Forest Products of Canada (up to 1908)—A. H. D. Ross.

Bulletin 5. Forest Conditions in Crowsnest Valley, Alberta—H. R. MacMillan.

Bulletin 6. Riding Mountain Forest Reserve—J. R. Dickson.

Bulletin 7. Forest Fires in Canada, 1908—H. R. MacMillan.

Bulletin 8. Forest Products of Canada, 1908—H. R. MacMillan and G. A. Gutches.

Bulletin 9. Forest Fires in Canada, 1909—H. R. MacMillan and G. A. Gutches.

Bulletin 10. The Farmer's Plantation—A. Mitchell.

Bulletin 11. Forest Products of Canada, 1909; Lumber, Square Timber, Lath and Shingles—H. R. MacMillan.

Bulletin 12. Forest Products of Canada, 1909; Pulpwood—H. R. MacMillan.

Bulletin 13. Forest Products of Canada, 1909: Cross-ties Purchased—H. R. MacMillan.

Bulletin 14. Forest Products of Canada, 1909: Poles—H. R. MacMillan.

Bulletin 15. Forest Products of Canada, 1909—H. R. MacMillan.

Bulletin 16. Forest Fires and Railways—R. H. Campbell.

Bulletin 17. Report on Timber Conditions along the Proposed Route of the Hudson Bay Railway (with map)—J. R. Dickson. (a)

Bulletin 18. The Rocky Mountain Forest Reserve (with map)—G. H. Edgecombe and P. Z. Caverhill. (a)

Bulletin 19. Forest Products of Canada, 1909: Cooperage and Boxes—H. R. MacMillan.

Bulletin 20. Forest Products of Canada, 1909: Tanbark and Tanning Extract Used—H. R. MacMillan. (a)

Successful Tree Planters, (Pamphlet).

Irrigation Bulletin No. 1: Irrigation in Saskatchewan and Alberta—E. F. Drake and J. S. Tempest.

Report of the Progress of Stream Measurements for 1909—P. M. Sauder.

The following maps may also be obtained on application:

The Riding Mountain Forest Reserve. Scale, one mile to an inch.

'The Pines' Forest Reserve. Scale, one mile to an inch.

Map showing Irrigation Lands and Irrigation Schemes in Alberta and Saskatchewan. Scale, 3 miles to an inch.

Map showing Distribution of Trees by the Forestry Branch in Manitoba, Alberta and Saskatchewan. Scale, 12½ miles to the inch.

Map showing Forest Regions of Canada. Scale, 50 miles to the inch.

The reports of the second (1908) and fourth (1910) conventions of the Western Canada Irrigation Association may also be secured from the Branch.

Any of these reports or maps will be sent gratis on application to the Director of Forestry, Department of the Interior, Ottawa.

(a) Will be published shortly.

Preserving Mine Timbers.

On a recent visit to Rossland, B.C., Prof. John Macoun, naturalist of the Canadian Geological Survey, visited a number of the mines of the place, with a view to studying the cause of the rotting of the mine timbers and possible means of preventing it. In the Central Star mine he obtained specimens of four species of the genera Polyporus and Trametes, which include many of the fungi most injurious to wood above ground.

Of the means to be adopted to preserve from decay timber used in the mines, Prof. Macoun writes as follows:—

In conversation with the manager of the mine, I suggested painting the posts, as the spores of the fungus must enter the wood to produce injury. I mentioned the methods adopted in the United States, and spoke of creosote, but really all these methods mean the same thing, the keeping of the spores out of the wood, because there can be no rot without fungus or algoid spores.

Since my return, the Director has mentioned a statement made by Mr. Watson, one of the mining engineers from Europe, that timber used in mines there has been preserved by immersing for a time in a strong saline solution before being used under ground. This I consider a complete solution of the difficulty, as no fungus is known by me to grow on trees or other woody matter which is found lying on the seashore. All wood on the seashore is sound, and all wood on the borders of lakes or rivers is rotten. A detailed description of the method referred to above follows:—

A method of treatment of timber, known as the Henry Aitken method, is now used at many collieries. In this process the idea is to soak the timber in water, raised to a temperature of from 190° to 200° Fahr., containing enough common salt to form a thoroughly saturated solution. The timber should be free from bark, fairly well seasoned and thoroughly dry. Any tank, either wood or iron, of a size suitable to contain the timber to be treated will do and the water should be heated. The time necessary for completing the process depends largely on the nature and size of the timber, but two days will, in general, be sufficient. By sawing off a small part of the timber being treated, it can be seen whether thorough penetration by the salt has been obtained. When the timber is removed from the treating tank it is soft and not in a condition for immediate use. It is dried by being put into a covered shed or stacked in the open air. The cost for treating timber by this process averages, in Great Britain, about one penny per cubic foot.

Some of the managers of the largest collieries in Scotland, who have adopted the process, write as follows:—

Mr. Maevie, manager Cadzow collieries, Hamilton, regarding the Aitken process for treating the timber for use in mines, states that in his five years' experience he had never seen the least indication of decay in any timber so treated. About four years ago, gears (every alternate one treated) were put in the main return airway of the No. 3 Pit Ell coal seam, Cadzow colliery. About a year ago all the untreated gears were replaced, owing to decay. The treated timber is still in use and in good condition. As regards the contention that the Aitken process reduces the strength of the timber, he had never seen anything to make him think that this was the case. Indeed, he had stopped using larch timber, and now used treated Scotch or foreign fir.

Mr. Ferguson, manager Benarty colliery, Fifeshire, writes that the Aitken process has been in use at the Lochore and Capeldrae collieries for upwards of six years, and during that time it has proved a great saving, not only in wages renewing broken timber, but also in the price of wood used, which is now nearly all foreign timber. The treated wood had stood in the return airways for six years and was quite sound. If this wood had not been treated it would have been replaced twice during the above period. No tree which had been treated had shown the slightest decay during the six years.

Mr. Carlow, managing director Fife Coal Company, Leven, Fifeshire, writes that the Aitken process had been in use for four years.

The following experiments have been made with the process: Two pieces of ordinary fir, three and one-half inches in diameter and three feet long, both weighing ten pounds before treatment, were selected. One of the pieces was treated by the salt process and the other was not. After being treated, the former weighed twelve pounds. Both were taken underground and placed in a return air-course, and after eleven months were examined and re-weighed. The untreated timber then weighed five pounds only, whereas the treated one weighed twelve pounds, being exactly the same weight as when it was put in. They were put back into the mine and allowed to remain eleven months longer, with the result that the untreated timber weighed six pounds and the treated timber weighed eleven and three-

quarters. They were again replaced in the mine, and after an exposure of three years were re-examined, and while the treated piece was sound the untreated one was decayed. Besides these tests, observations were made on the treated timber put into main roads, beside other timber not treated. The treated timber remained damp and fresh, while the untreated crown-trees were dry and soft on the outside, showing that decay was in progress.

The amount of salt that timber will absorb depends on the firmness of the wood and its dryness at the time of treatment. Norway fir absorbs from fifteen to fifty per cent. of its weight, that is, it becomes fifteen to fifty per cent. heavier after treatment, while larch crown-trees absorb only ten per cent.

The cost is about one penny per cubic foot for salt and one farthing for labor, a total cost of about one and a quarter pence per cubic foot.

Forest Survey of Sweden.

One Province to be 'Gridironed' as a Test for Suggested Method.

The conditions in Swedish forests are so similar in many respects to those with which the forester has to deal in this country that Swedish forestry methods are attracting much attention in Canada. In the former country steps are now being taken to secure a valuation survey, or inventory, of its entire forested area.

In a recent letter Mr. H. C. Wallin, a graduate of the Swedish State Forestry Institute, now with the Dominion Forest Service, gives the following interesting note with regard to it:

'This question arose first at a meeting of several Swedish Forestry Associations in December, 1908. It was considered that an examination of the forests with the object of obtaining reliable information as to the age, growth, volume content, etc., etc., of the timber would be of the greatest value not only for forest management particularly, but also for the economic life of the country in general.

'Quite large areas of government land as well as forest under private ownership have, of course, already been cruised and examined. But as those examinations have been made with different objects in view and with very little uniformity as to the methods used, they must be considered of comparatively little value for the ascertainment of the present rise and productive capacity of the forest capital.

'At the meeting mentioned above a commission consisting of men of large experience in forestry matters was appointed to inquire into a cruising method that with the least possible expense would allow for the examination of a sufficiently large percentage of the total area to obtain data from which accurate conclusions could be made.

'The Commission suggest in their report that the whole country should be traversed by a system of parallel strips 10 metres (10 metres 32.8 ft., practically half a chain) wide. All trees on these strips should be counted, measured and classified. Every fiftieth of the measured trees is closely examined as to height, tapering, age, increment, etc., etc.

'The distance covered by all different forest and soil types which are crossed by the valuation lines are also put down, which makes it possible to calculate the distribution of types on the estimated area.

'The commissioners suggest that, before large sums are spent on a cruise of the whole country, their method be given a trial in one province. Varmland, with a forested area of about 1,500,000 hectares (3,700,000 acres or nearly 5,800 square miles), where in the north part the valuation strips should be run 4 kilometres (about 2½ miles) and in the south 2 kilometres (about 1¼ miles apart. Provided that the strips are 10 metres wide, this gives an examined area of, in the first instance, 0.25 per cent. and in the second 0.5 per cent. of the entire area. This is a very small percentage; but, having regard to the large territories to be dealt with, the commission hope that it will prove sufficient.

'Usually at valuation surveys made by the government or private concerns in Sweden the strips (10 metres wide) are run at every 100 or 200 metres (about 110 or 220 yds.) which covers 10 or 5% of the total area.

'The report of the Commission was laid before the parliament which voted a sum of $16,000 (60,000 "Kronor") which was the amount asked for by the commissioners to cover the expenses of the valuation survey in Varmland.'

TAXING TREE PLANTING.

Winnipeg Free Press.

It has well been said that he who does his part in awakening, stimulating, and maintaing public interest in tree-planting is worthy of honor as a patriot. Here in Western Canada, as in the States across the boundary, tree-planting is of vital importance to the country's welfare and progress. In recognition of this the Forestry Branch of the Department of the Interior was established, for the promotion of tree-planting on the prairies, as well as for the increase and conservation of the forest wealth of the Dominion generally. Young trees are furnished by the Dominion Government to individual owners of land, and expert advice also and superintendence in connection with the planting of them and the care of them. The Government is also doing a great amount of tree-planting itself. The purpose of Arbor Day is to impress upon the public attention the importance of tree-planting.

It might be expected that the railway companies, which have reaped, and are reaping, such abundant wealth from Western Canada, would, as a matter of self-interest, to say nothing of public spirit, co-operate in the encouragement of tree-planting on the prairies. Everything that helps to further the development of this country means more money for the railways. But they do not let considerations of that sort interfere with the operation of the principle of 'all that the traffic will bear.' They believe in putting that principle into complete operation in the present, right now, and of doing it up to the hilt.

In one of the early articles in the present Free Press series on freight rates, comparisons were placed before the public, showing the rates on trees, shrubbery, and nursery stock in this country and in the adjoining States, for corresponding mileages. The comparisons covered Western Canada and the adjoining States, both for carload lots and for less than carload lots; the rates on this side of the boundary running from twice to nearly three times the rates across the line.

From St. Paul to Crookston, for example, a distance of 300 miles, the carload rate (16,000 lbs. actual weight) is $33,60, as against $76.00 from Winnipeg to Wolseley, a distance of 296 miles; and from St. Paul to Neche, a distance of 401 miles, the less than carload rate on nursery stock in boxes is 24c. per 100 lbs., while from Winnipeg to Moose Jaw, 400 miles, it is 67c. It is not necessary to set forth further figures here. The view taken by the railway traffic officials in this country is that trees for planting and other nursery stock are simply freight on which to levy 'all that the traffic will bear.'

A CANADIAN FOREST RANGER.

Philadelphia Saturday Evening Post.

It has always been difficult to understand the difference in mental attitude toward the restraints of the law that exists between the American and the man who lives just north of him, across the Canadian line. In that country it is not considered a hardship to pay either reverence to Nature or a tribute to those in whose charge lies the protection of Nature and natural resources. A thousand miles north of the British line one has seen a fire guardian, the only officer of his kind in a section of country hundreds of miles in extent. A splendid, quiet, self-respecting chap this man was, too; one whose word was law and accepted as such unhesitatingly by red and white. Part of this man's duty was the posting of fire notices, each of which had a good, stiff penalty attached, in all the places where human beings, red or white, were apt to see them—steamer landings, fur posts, traders' stores. Nor did this man dread the red men so much as he did the newcomers of the white race, always more careless about fires than were the aborigines.

One day during a steamer voyage this fire guardian saw smoke rising on the horizon far inland from the river on which we were travelling. He stopped the boat at once, got his pack together and went ashore. As he figured it out, this fire was forty miles away, probably at the edge of a certain large prairie surrounded by heavy woods. He would reach it in the afternoon of the second day on foot. He would carry most of his camp kit on his back until that night; then would cache some of it, and would leave yet more of it midday of the next day, cached against his return to the river, where he could get supplies or find the trail in and out of the country. He did not know who had started the fire or what shape the fire itself would have by the time he got to it. All alone, a sturdy and self-reliant figure—representing the law, representing civilization even in the wilderness, representing a decent regard of organized society for the organized society that is to follow us—he set out on foot for his wilderness journey across an untracked country. In all of one's experience with outdoor men, rarely has one met a better, simpler and nobler figure than this one. His profession is precisely that of our own forest rangers. We ought to back these men precisely as an older Government backs its young men in an older wilderness than ours.

THE FOREST FIRES.

By Arthur Guiterman, in Life.

Is this the Forest Primeval?—that redolent, hallowed cathedral
Lifted by Nature to God, the solace and joy of His creatures,
Health-giving, tranquil and strong, the source of beneficent waters,
Wooing the quickening rains, guarding the bountiful wheat lands?
This was the Forest Primeval;—this roaring, devouring furnace
Billowed and sheeted with flame, a pitiless, raging inferno.
See! how the sentinel pines go down, while the red-hearted cyclone
Greedily sweeps on the settlements, whirling in panic before it
Caribou, timber-wolves, deer, snorting and plunging and bounding
Mingled with cattle and men, poured through the streets, where the houses
Melt in the fury!—And now, nothing remains but the timbers
Desolate, blackened and charred, heaped over smoldering bodies.
There let the fire-weed grow, dropping memorial blossoms.

Only a camp-fire brand,—only a spark from an engine,
One of the myriads blown daily and nightly at random—
Such was the procreant seed. Come, let us thresh out the harvest.

A GREAT CANADIAN SURVEYOR.

Toronto Star.

Alexander Niven, who died in Toronto on May 7, at the age of 75, was one of the remarkable figures of this Province. His was a life of strenuous endeavor. Since 1858 he ran survey lines into the Ontario bush like testers into a cheese. North and south, as meridians, east and west, as base lines, his narrow laneways in the forest may be seen throughout New Ontario to-day, some of them overgrown again, but all of them true as the stars and the theodolite and higher mathematics could make them. He was the first surveyor to run a line to James Bay.

The winter of 1862 was spent in surveying townships in Manitoulin. The next 45 years, with scarcely a break, were spent by Mr. Niven in the service of the Government. In 1883, he surveyed the township of Widdifield, where North Bay now stands.

Later in the same season, he ran the meridian north to Lake Timiskaming, where Haileybury stands to-day. He outlined townships at the foot of Lake Timagami, in the winter of 1884, and during the next two years outlined the clay belt from present-day Haileybury as far north as Englehart, where it stands to-day. In 1890 he ran the boundary between Rainy River and Thunder Bay through that dense tangle of spruce and jack pine, and in the next three years outlined the townships north of Rainy Lake, Lake of the Woods, and as far north as Superior Junction as known to-day.

In 1896 he began the survey of the north and south line forming the boundary between the districts of Thunder Bay and Algoma, and in two years he ran that out to James Bay. In 1902 Mr. Niven outlined the Timagami Forest Reserve. Many of the lakes and rivers in the north country were first made known and placed on the map through his exploration lines, notably the Little Abitibi River. He was the first explorer to cross the muskeg country of the lower Albany overland.

BEATITUDES OF TREE, SHRUB AND BUSH.

(C. Roscoe Brown, in Saskatoon Phœnix.)

Blessed is the man who appreciates the value of trees, shrubs and bush fruits; for his home shall become a place of shelter from the storm, with bowers of beauty, and fruit in due season.

Blessed is he who deplores the fact that he has not already made a beginning in growing trees, shrubs and small fruits; for he shall yet find comfort for himself and his children if he goes to work now.

Blessed is he who, living on the bleak prairie, hungers for a beautiful sheltered dwelling place; for he shall have it if he goes about it aright.

Blessed is he who thinks of the welfare of his wife and children, who provides a shelter for both man and beast; for he shall obtain mercy.

Blessed is he who is pure in heart; for he shall see God in tree and shrub and flower—yea, verily, he shall become like the tree spoken of by the psalmist, bringing forth his fruit in his season, his leaf also shall not wither and whatsoever he doethe shall prosper.

Blessed is the man who is adversely criticised for well-doing; for he, if he perseveres, shall live to see others following where he leads; he shall live to see a treeless prairie become dotted with groves—oases of refuge and delight in a wind-swept plain.

AMONG THE RIVER-DRIVERS.

Great endurance is demanded of the riverman. It is characteristic of them, says a writer in the Outing Magazine, that they accept whatever comes as a matter of course; or, perhaps more truly, it is their pride never to show emotion of any sort.

One man was dragged out by the collar from a very dangerous predicament between two parts of a breaking jam. To gain safety, his rescuer, burdened by the victim of the accident, had fairly to scale the breast of the falling logs. For ten seconds it looked like sure death to both, but by a combination of audacity and sheer luck they reached the bank.

Most persons would have paused for congratulations and to talk it over. Not they. The rescuer, still retaining his grip on the man's collar, twisted him round and delivered one good kick.

'There, take that!' said he; and the two fell to work without further comment.

One February, during a thaw, Jimmy Downing, a foreman, fell over a dam into the eddy below. He could not swim, and owing to certain sets of current, growth of timber and lay of ice, no one of his men could get to him.

The water was cold, and sucked with terrific force beneath a shelf of ice at the lower end. Sure death again. But Jimmy, befriended of the gods, hit his knee against a single little ledge. Although half-drowned, he managed to cling there, and after a moment to drag himself out.

Jimmy coughed up a quart or so of water, shook himself, and gazed back at the whirlpool whence he had been so miraculously extricated.

"Confound it all!" said he. "I lost my peavey."

NEW ZEALAND'S FOREST.

New Zealand has for some years past been engaged in carrying out an extensive scheme of afforestation to provide against the depletions caused by the growth of the saw-milling industry. For a portion of this work state prisoners are employed, camps controlled by gaol officials being formed near the sites of the various nurseries and plantations. The planting is supervised by experts, and in Rotorua alone more than twenty-four million trees have been permanently planted out by prison labor. Not only have the results been satisfactory from the point of view of afforestation, but also the conditions of the camp life are said to exercise a most beneficial influence on the characters of the prisoners.

PLANT TREES.

What do we plant when we plant the tree?
We plant the ship which will cross the sea;
We plant the masts to carry the sails,
We plant the plank to withstand the gales,
The keel, the keelson, and beam and knee;
We plant the ship when we plant the tree.

What do we plant when we plant the tree?
We plant the houses for you and me;
We plant the rafters, the shingles, the floors,
We plant the studding, the laths, the doors,
The beams and siding, all parts that be;
We plant the house when we plant the tree.

What do we plant when we plant the tree?
A thousand things that we daily see;
We plant the spire that out-towers the crag,
We plant the staff for our country's flag,
We plant the shade, from the hot sun free;
We plant all these when we plant the tree.

—Henry Abbey.

TREE CUTTING UP-TO-DATE.

For some time it has been known that a wire drawn tight and heated by an electric current red hot would cut its way through a thick tree. Mr. Hugo Gautke, a German inventor, has improved this process by causing the wire to become incandescent simply by friction in working its way through a tree. A steel wire one twenty-fifth of an inch in diameter is used, and it is said that this can be made to traverse a tree twenty inches in diameter in six minutes. The wire is worked to and fro rapidly by an electric motor and becomes so hot by friction that it burns its way quickly through the trunk. The wire will cut through the tree without the use of wedges to keep the cut open, and the cut may be made several feet up the tree, on the ground level, or even below the ground. The electricity may be brought to the forest from a disance by a cable; a gasoline motor of 10 horse power and a dynamo are all that is required to use this process. It is contended that the great trees, ten feet thick in the forest on the west coast, can thus be felled with ease.

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THE FORESTER'S RETURN.

Denver Republican.

I'm back on the job by the singing river,
Far from the town with its money-mad,
Back where the quaking aspens quiver—
And I'm glad.

I'm back to the shack where the trail is winding
'Mid flowers of every scent and hue,
And I felt when I gazed, the hot tears blinding—
Wouldn't you?

I'm back to the creak of the good old saddle,
To the equine friends that never doubt;
Back to the haunts—with canoe and paddle—
Of the trout.

There's work to do, and there's work in plenty,
And we sleep in the open, if fate so wills,
But no man is more than one-and-twenty
In the hills.

THE CANADIAN FORESTRY ASSOCIATION

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains, and on streets and highways.

(5) Reforestation where advisable.

(6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership $10). Applications for membership or requests for information may be addressed to the

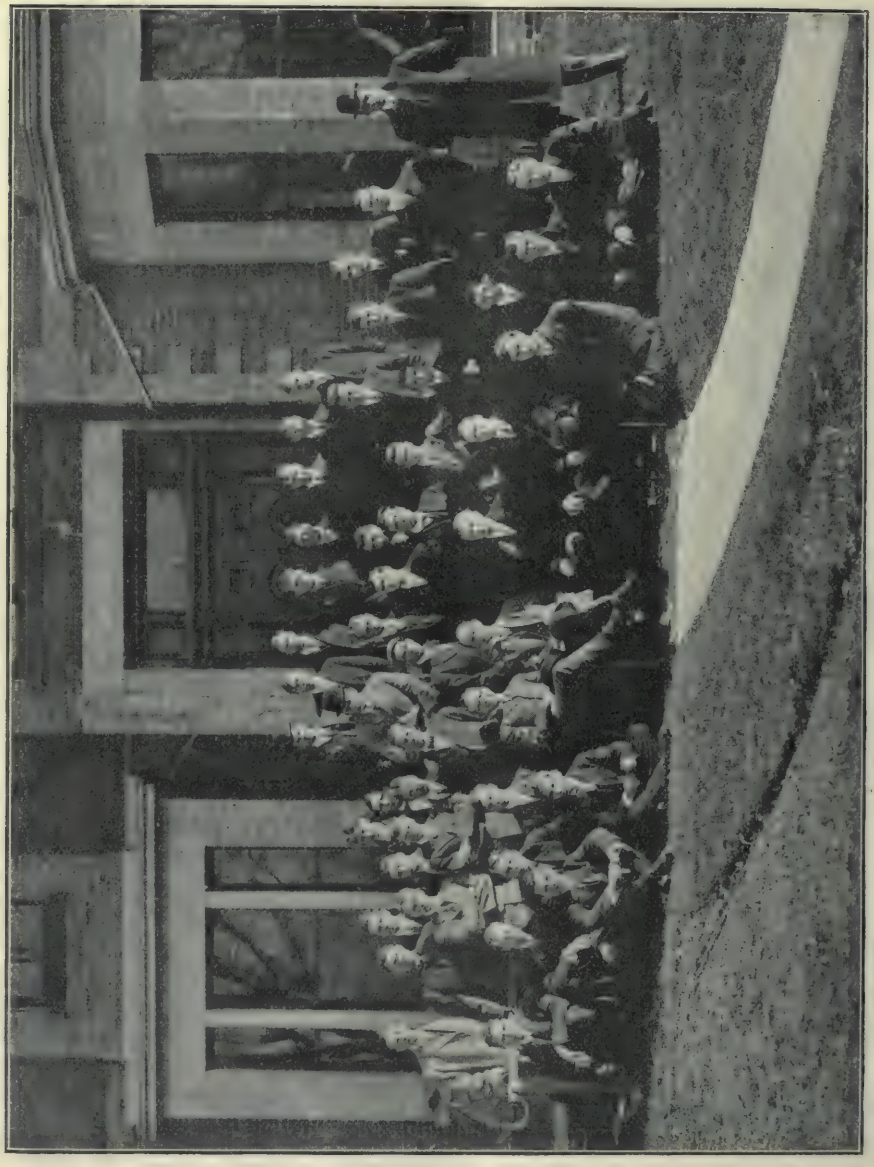
Secretary, Canadian Forestry Association,
Canadian Building, Ottawa, Canada.

FORESTRY COMMITTEE.

The House of Commons Committee on Forests, Waterways and Waterpowers for the current session of Parliament consists of the following twenty-six members:—Messrs. Arthurs, Béland, Boyce, Campbell, Carvell, Chew, Currie (Prince Edward), Edwards, Fisher, Fowke, Haggart (Lanark), MacNutt, McLean (Sudbury), Magrath, Molloy, Monk, Perley, Pickup, Price, Richards, Savoie, Sifton, Tobin, White (Renfrew), White (Victoria, Alta.), and Wilson (Laval). Ten members form a quorum.

The proposal to add forestry as a subject of examination in the Final Honours School of Natural Science at Oxford University has for the present been defeated, Convocation rejecting it by a majority of seven votes.

The committee of the Ontario Experimental Union on Forestry for 1911-1912 is composed of the following: E. J. Zavitz (director), H. R. MacMillan and E. C. Drury.



Students in Faculty of Forestry, University of Toronto, 1910-1911.

A MUCH-TRANSLATED PAMPHLET.

The pamphlet entitled 'Advice to Settlers regarding the Handling of Fire' is now issued by the Forestry Branch in eleven different languages, the latest additions being translations into Italian, Bohemian and Polish. The other languages are English, French, German, Swedish, Norwegian, Russian, Ruthenian and Hungarian.

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Canadian Forestry Journal

VOL. VII. JULY-AUGUST, 1911 No. 4

Falls on Sawkill River, near Summer Camp of Yale Forest School.

OTTAWA, CANADA.

FACULTY OF FORESTRY

Canadian Forestry Journal

THE CANADIAN FORESTRY ASSOCIATION

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
(2) The preservation of the forests for their influence on climate, soil and water supply.
(3) The promotion of judicious methods in dealing with forests and woodlands.
(4) Tree planting on the plains, and on streets and highways.
(5) Reforestation where advisable.
(6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership $10). Applications for membership or requests for information may be addressed to the

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Canadian Building, Ottawa, Canada.

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Forestry in the University of New Brunswick.

By Prof. R. B. Miller, M.F.

The Forestry Department, while growing slowly in numbers presents every reason for encouragement. Many students are naturally comparing its advantages as a profession with those presented by engineering which because of so much construction work in Canada is always a popular one. The matter of securing positions, both permanent and temporary, is gradually adjusting itself and as the students increase it is felt that the opportunities will multiply. As in other professions, a job cannot be promised the graduate but the openings must be canvassed and new fields discovered for the output. As the Chancellor said at the Quebec convention last winter, the forester must prove his worth and must take his chance of finding a position the same as the engineer. He must serve his apprenticeship, get his experience by hard knocks and win his place in the community.

In the beginning this matter of employment was all uncertainty, now prospects are brightening. The Forestry Branch, Ottawa, has so far been the best employer ,this year taking five men for the summer season, in both permanent and temporary positions. With the larger number of survey parties put out each year and a good record made by students and graduates it is hoped that this outlet for men will gradually increase. These trips for the younger men in the Sophomore and Junior years under competent chiefs are broadening in their influence, put the student in touch with the great aims and purposes of the profession and bring him back with renewed ambition for work. Other men have been placed with paper companies and the railroad companies and consulting foresters are looking to us for a small number of men each year. One good man sent to them and succeeding means much for the future of the school.

Canadian Forestry Journal

VOL. VII OTTAWA, JULY-AUGUST, 1911 No. 4

THE official organ of the Canadian Forestry Association. A magazine devoted to the interests of forestry and in general to the advocacy of the wise and conservative use of the natural resources of Canada.

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Literary Contributions and communications regarding editorial matters should be sent to Mr. F. W. H. Jacombe, Canadian Building, Ottawa. Communications regarding subscriptions, changes of address, and advertisements should be sent to the Secretary Canadian Forestry Association, Canadian Building, Ottawa, Canada.

The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

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Simcoe County (Ont.) Waste Lands.

Barrie Examiner.

The Ontario Government, as is well known, has made an initial step towards the reforestation of considerable areas of waste lands — 'blow-sand' lands—lying in various counties of Ontario. The initial step is being made in Norfolk County where the Government has bought a thousand acres of these waste lands, and has begun the work of planting a forest nursery. There is no reason to doubt that this experiment will be successful and is likely in due time to justify the expenditure. The results in forestry in Europe, especially in Germany and France, where it has been practised constantly for the last eighty years, have proved the practice to be a

financial success of some magnitude.

Let us see, then, what is the situation in Simcoe County. There is a total area of over 60,000 acres of waste lands in this county capable of reclamation. Fifty-five thousand acres of it is situated in the townships of Tossorontio, Essa and Sunnidale, the rest lying north of Craighurst and divided between Flos and Medonte townships, and there are the Midhurst Plains in Vespra some five miles from Barrie. All these sandy wastes are incapable of profittable agriculture, though they once supported magnificent pine forests. These waste lands in Simcoe are different from those of Norfolk and other counties in Ontario, in that there is no 'blow-sand' in the Simcoe lands. The surface is to some extent covered with old scrubby seed trees of red and white pine, which experts say would soon give a splendid reproduction of the original forest if it were not for the ever-recurring ground fires, which periodically sweep over these lands, killing the young trees ,and also impoverishing the soil by burning up the small amount of leaf litter and other materials which should go to enrich the soil. To the ravages of the fires is added also the industry of the wood thieves which is unremitting.

The problem, therefore, in the reclamation of these waste lands is far simpler than in most places in Ontario where there are waste areas. It is held by the Government forestry experts that the replanting of young trees, which is necessary in Norfolk and elsewhere, is almost wholly unnecessary here. The only attention necessary to reclaim these Simcoe lands would be the prevention of fires, the cleaning up of the land, and the locking up of the wood thieves Then, as to the cost of upkeep of the necessary attention and superintendence, we have it on the authority of Dr. B. E. Fernow, Dean of the Faculty of Forestry, Toronto University, that five thousand acres of naturally grown young timber, such as we have in this county, could be guarded by two men employed all the year round for $1,000 a year, or a cost with interest of $112,797 for fifty years. Add to this the original cost per acre with accrued interest for the same term of years, and the total will be the net cost of the 5,000 acres. Then let the County Council Committee estimate the value of the timber crop at the end of fifty years, and they will be able to judge of the wisdom of this reclamation of waste land as an investment.

In our article of three weeks ago we cited the estimate of the profit at the end of 60 years in the Norfolk County plan of reforestation as given by Prof. Zavitz, who is in charge of the work, at $639.66 per acre. The amount of standing timber on one acre at the end of 60 years being estimated at 80,000 feet B M., valued at $10 per thousand, making a gross value of $800. The cost of the single acre allowing for everything, compound interest at 3½ per cent. during the 60 years, and deducting the original purchase money, would be $160.34, leaving the net profit for the acre at $639.66.

This estimate shows a most profitable undertaking in the interest of the province, and considering the main object to be conservation of public benefits in the way of climatic conditions, rainfall and augmentation of economic water power in the streams, it is fully justified in its Norfolk County undertaking. But how very much better still is the prospect for the province in taking hold of the work in this county where it is not a matter of reforestation at all as in Norfolk, but merely reclamation by efficient guardianship of the natural forest growth which now exists.

Prof. Fernow's estimate of the cost of such reclamation as given above is the true basis of computation for the work in Simcoe county and not that in Norfolk.

Mr. E. G. Joly de Lotbiniere.

In the death of Mr. E. G. Joly de Lotbiniere at the family residence at Point Platon near the city of Quebec Canada loses one of her leading and most patriotic citizens and the Canadian Forestry Association one of its most enthusiastic and untiring supporters, while a wide circle mourn a most true and devoted friend. On Friday, July 14, Mr. de Lotbiniere was in the city of Quebec in his usual health. That evening on returning home to Point Platon he had a slight attack of acute indigestion. He was much better in the early part of Saturday,but he became ill again toward evening and passed away before midnight, heart failure being the immediate cause of death. Madame de Lotbiniere and their only son were with him at the time. There is a peculiarly pathetic note just here in that the son, Alain,who graduated in forestry under Dr. Fernow at the University of Toronto this spring, had been in the Quebec woods away from home since the close of the university term and came home only a few days before in order to attend the celebration of the anniversary of the wedding of his father and mother.

Mr. Edmond Gustave Joly de Lotbiniere, the eldest son of the late Sir Henri Joly de Lotbiniere, was born in the city of Quebec on November 12, 1859, and was therefore in his fifty-second year. He was educated at Bishop's College, Lennoxville, and studied law under his father, who was a leading barrister in Quebec. As a young man he took an interest in military affairs and was an officer in the 8th Royal Rifles, Quebec. He was called to the bar and practiced for some time but the devotion of the time of his father, Sir Henri, to public affairs (he was at different times Premier of Quebec, Dominion Cabinet Minister, and Lieut.-Governor of British Columbia) threw the management of the estate of ninety thousand acres at Pt. Platon upon the son, who for about twenty-five years past devoted himself to that work and gave up the practice of law.

Sir Henri Joly de Lotbiniere, as is well known, was one of fathers of scientific forestry in Canada, and was the first president of the Canadian Forestry Association. The estate at Point Platon was one of the old seigniories, and under the seigniorial law the holder was obliged to allot land to settlers or tenants so long as he had any unoccupied and these tenants were to pay, in kind, a certain proportion of the crop. About half the Lotbiniere seigniory was taken up by settlers in this way before the abolition of seigniorial tenure in 1856, but by the provisions in the leases made by Sir Henri and his father a considerable proportion of the settled area is reserved in perpetual wood lots. The remaining

half is in forest, and for about eighty years now it has been handled with increasing care. It is one of the few stretches of timber-land in Canada owned in fee simple, and the family is thus one of the very few on this continent who have handled their forests in a rational way for several generations with the object of securing a perpetual timber crop. Sir Henri, as stated before, did much of this. He not only looked to the perpetuation of the native species but made experiments with plantations of trees not indigenous to the soil.

But for at least twenty years before Sir Henri's death the practical oversight of these forests devolved upon his son. The old manor house has been for many years at Point Platon, overlooking from a high cape the broad St. Lawrence. While the family were engaged in professional work in the city of Quebec, it was the custom to live at Point Platon in summer and in the city of Quebec, about forty miles distant, in the winter. However, of late years, owing to improved railway facilities and by building another house, 'The Hermitage', on the line of the Intercolonial railway, some distance away from the river, Mr. de Lotbiniere was able to live all the year around on the estate. Here he carried on and extended the work begun by his father and grandfather, and the growing scarcity of timber made the forests increasingly valuable. During the late winter he carried through a series of tests to ascertain the best method of disposing of debris after lumbering, and came to the conclusion that for a thick spruce forest, such as he had to deal with, the best method was of 'downing' the tops, i.e. lopping them off and spreading them around on the forest floor. The result of his tests he embodied in a paper which he read at the Canadian Forestry Convention at Quebec, and which appears in the Annual Report, just issued.

He was a member of the Canadian Forestry Association from the beginning. He was president in 1906, the year in which Sir Wilfrid Laurier convoked the Canadian Forestry Convention in Ottawa — the first convention to attract national attention — and on that occasion carried out the duties of the office with tact and dignity. He took the deepest possible interest in all that concerned the forest, and was President of the Fish and Game Protective Association for Quebec and district at the time of his death. He was delighted when his son voluntarily decided to give up a course in medicine and to study forestry under Dr. Fernow. With the greatest pride in his work and with a strong conviction of the necessity of progressive forestry measures in Canada, he always spoke with that modesty which was characteristic of the family. A few months ago, when asked how the Lotbiniere forests had suffered in respect of fire, he said 'Speak it in a happy hour, we never had a fire'. This did not mean simple good luck, for he employed a considerable number of fire rangers. The Intercolonial Railway runs for twelve miles through the property and at a recent meeting he said that his rangers had put out as many as ten fires in a day on that stretch.

It is interesting to note that from the beginning this territory has had a reputation as being covered with good forests. The Seigniory is described in 1815 by Lt.-Col. Joseph Bouchette, Surveyor General of Canada, in his Topographical Dictionary of the British Dominions in North America. It is a curious coincidence that this famous surveyor general was the grandfather of Mr. Errol Bouchette, LL.B., F.R.S.C., for some time secretary to Sir Henri, and now of the library of Parliament. Col. Bouchette states that on the elevated ground of Lotbiniere county the timber is beech, maple, birch, hickory and pine, and, on the low parts, spruce, basswood and fir. Then, speaking of Lotbiniere seign-

iory in the county of Lotbiniere, after describing its situation and boundaries, he says that it was granted in several parcels, viz.: Nov. 3, 1672, half a league in front by one and a half leagues in depth to Sieur Marsolet; Nov. 3, 1672, two and a half leagues in front by two in depth, adjoining Ste Croix, to Sieur de Lotbiniere; April 1, 1685, half a league in front by two leagues in depth to Sieur de Lotbiniere, being the vacant space between the two former grants. In 1693 the depth from the river was considerably added to so that the seigniory had a frontage on the river of three and a half leagues with a depth of six leagues. He goes on to say that the soil in general is excellent and so advantageously varied that every product of the country may be raised. It is well stocked with fine elm, ash, maple, plane, wild cherry, and other timber. The banks of the rivers du Chene, Huron, and Boisclere produce pine of first-rate growth. Notwithstanding the superior fertility of the soil about one-sixth part only of the grants are settled. He notes that 580 farms of ninety acres each had been surveyed and that 465 of these were under the management of industrious tenants, producing abundant crops of grains, etc. Near the middle of the front stand a handsome stone church and parsonage house and near them a few neat and well built houses; indeed, this is characteristic of the major part of the dwellings, the number of which is considerable, as the population amounts to 3,400 souls. On the east side, near the St. Lawrence, is a small domain of only twelve acres, wholly uncultivated, thickly covered with timber trees of a superior description, and containing the seigniorial mill. On the different streams are six sawmills and five manufactories of potash. All the roads in the seigniory as well as the main road along the St. Lawrence are always kept in perfect repair.

This description would largely fit the place today, notwithstanding the abolition of seigniorial tenure, and it shows that the family were then, as now, considerate of those who lived about them. The spirit of the best of the old nobility shone out in their kindness, generosity and gentleness and the late representative fully carried out the traditions of the house.

Mr. de Lotbiniere was married on July 14, 1885, to Lucy Geils Campbell, daughter of the late W. D. Campbell, prothonotary of Quebec. By this union there is one son, who, with Madame de Lotbiniere and two brothers and three sisters, survives. The brothers are Alain C. and Henri Gustave, and both are Majors in the Royal Engineers at present on service in India. The surviving sisters are Julia, wife of St. George J. Boswell, Esq., Quebec; Margaretta Anna, wife of Lt.-Col. Herbert Nanton, Royal Engineers, and Ethel Blanche, wife of Lt.-Col. Dudley Mills, Royal Engineers.

The funeral was held from the Anglican Cathedral where the family have worshipped for generations, to Mount Hermon Cemetery. It was largely attended by the leading citizens of city and province, and there were also present a large representation of the men from the estate. The service in the Cathedral was conducted by the Bishop of Quebec, assisted by the Cathedral clergy and Rev. Frederick George Scott, rector of St. Matthews. The Dominion Parliament, the Quebec Cabinet, the Bench and Bar, and the mercantile and lumbering interests were represented, while the forest service of Quebec, with which Mr. de Lotbiniere was naturally in very close touch, was represented by Mr. W. C. J. Hall, an old schoolfellow, for the protective branch, and Mr. Avila Bédard, M.F., for the forestry branch.

When the news of the sudden death reached Ottawa, as many directors of the Canadian Forestry

Association as were in town were communicated with by telephone and they decided to have the Association represented at the funeral by the Secretary, and amongst the many floral tributes was one from the Association, bearing on a pillow of roses a tiny spruce tree.

Mount Hermon Cemetery is a beautiful, restful spot on the banks of the broad St. Lawrence, just a little above Wolfe's Cove, and here, according to the solemn ritual of the Church of England, on a perfect midsummer day the mortal remains were laid to rest in the family burial place, beneath the shadow of the magnificent pines he loved so well, and amid the genuine sorrow of the people of the community.

DEATH OF PROF. MAYR.

Professor Heinrich Mayr, of Munich, one of the best-known of European foresters, especially on this continent, died on the twenty-fifth day of January last. Few botanists or foresters had such an extensive knowledge of forest flora as he. He had travelled three times around the world and made an intimate study of the forests of many regions. Among these was North America, the fruit of his studies here being the well-known 'Waldungen von Nord Amerika.' In the late eighties of last century he accepted a chair in the Imperial University of Tokio, Japan, and spent some three years in that country. He then returned to Bavaria, where he occupied the chair of Sylviculture and Forest Utilization in the University of Munich. In addition to his forestry knowledge, Professor Mayr was an excellent linguist, speaking English, French, Italian, Japanese and Russian with fluency. The Experimental Forest Garden at Grafrath was granted him by the government in 1894.

THE BILTMORE FOREST SCHOOL.

The Biltmore Forest School is now located at Marshfield, Oregon, U.S.A., where the professors and students arrived on August 15, having left Cadillac, Mich., U.S., on August 5. Short visits were made en route to Duluth, Minn., Cass Lake, Minn., the Glacier National Park, Montana, and Portland, Oregon. Six weeks are now being spent in studying Western forests and lumbering. For the past year or thereabout the students have enjoyed exceptional facilities of becoming acquainted with the forests and lumbering in both America and Europe. From November 1st up to the middle of March, 1911, was spent in and around Darmstadt, Germany. During that time, in addition to Dr. Schenck's lectures, work was taken at the 'Polytechnicum', or technical school, of Darmstadt. In addition to frequent short excursions from that place, the first two weeks of December were spent in Saxony, where Dresden was the headquarters, a two days' trip to the forest school at Tharandt being included in the program: the second half of January, again, was spent in the heart of the Black Forest. Not only the German forests but also German methods of manufacture were studied with much interest. Leaving Germany about March 15, the school sailed from Rotterdam, arriving in New York on March 27. After a few days' vacation work was resumed at Lake Clear, in the Adirondacks, New York State, where a few weeks were spent, and then the school again journeyed to North Carolina, for study in the Appalachian forest region at Canton and other points. Thence, on July 12, the members of the school went to Cadillac, Mich., visiting en route Fort Wayne, Indiana, and Grand Rapids, Mich. Despite the many changes in location the work of direct instruction at the school has been well kept up, both by the regular staff of the school and by special lecturers.

WORKING IN BRITISH COLUMBIA.

Mr. A. H. D. Ross, lecturer in forestry at the University of Toronto, is again this summer in charge of work being done on some of the timberlands of British Columbia. The work of the parties is the making of studies of the rate of growth of commercial timbers in different parts of the province. Mr. Ross has working under him two parties. Of these one is in charge of Mr. L. M. Ellis, B. S. F., who has with him Messrs. Tilt, Scandrett, Christie and Connell; the other has as its head Mr. J. D. Gilmour, B. S. F., with whom are Messrs. McFayden, Edgar, Greenwood and Brown. All those named are students of the University of Toronto.

Ontario Shade Tree Legislation

The legislation of the province of Ontario in regard to the planting of street and shade trees is, for the most part, contained in 'The Ontario Tree Planting Act',[1] and certain clauses of 'The Consolidated Municipal Act',[2] and subsequent amending acts.

Planting.

Planting by individuals.—The Ontario Tree Planting Act (section 2, sub-section 1) grants permission to anyone who owns land adjacent to a street to plant trees on that part of the street contiguous to his land, so long as the tree or trees do not become a nuisance or obstruct the use of the street .

Tree may be planted along toll roads under the same conditions as along other highways, by the municipal council or by individuals. (General Road Companies Act,[3] sec. 147.)

Planting by Municipal Authorities.—The municipal council of a city, town or village may pass a by-law authorizing the board of park management, park commissioner, or other officer, or three park directors to plant trees on streets or in parks. (Municipal Act, section 574, sub-section 4).

The council of any city, county, township, town or village may expend money in planting or preserving street trees or grant money to any person or association for so doing. (Municipal Act, section 574, sub-section 2e).

Property rights in trees so planted.

Trees so planted on highways become the property of the owner of the property adjacent to the highway and nearest the tree so planted. Such is the case also with any tree left standing on the highway. (Ontario Tree Planting Act, s. 2, sub-section 3.)

Bonuses for tree planting.

The Ontario Tree Planting Act (section 5) provides that the council of any municipality may pass a by-law providing for the payment of a bonus up to twenty-five cents per tree for each tree (of certain species) planted. This by-law must also make provision for a tree inspector to be appointed to supervise planting and for the protection of the trees against injury or removal by any one (even the owner) except by the authority of a special resolution of the council.

No bonus is to be paid for trees planted less than fifteen feet apart, and the council is not to be liable to pay a larger sum than would be payable if the trees were planted thirty feet apart. (Ontario Tree Planting Act, sec. 4.)

The Municipal Act (section 574, sub-section 1) authorizes the council of any city town, village or township to pass a by-law giving a bonus of *not less than* twenty-five cents for each tree planted.

[There will be noted here an apparent contradiction in the legislation, the Tree Planting Act stipulating that the bonus shall be "up to" i.e., not more than, twenty-five cents, while the sections of the Municipal Act quoted place the bonus to be allowed at "not less than" twenty-five cents. On writing to the Attorney-General's department regarding the apparent contradiction, the editor received the following reply:

'I would think that the effect of the legislation of 1903' (i.e., the Consolidated Municipal Act) 'would be to override the provisions of R. S. O. 1897, cap. 243'. (the Ontario Tree Planting Act).]

[1] R. S. O. 1897, chap. 243.

[2] 3 Edw. VII (1903), chap. 19, s. 574 and 575.

[3] R. S. O., 1897, chap. 193, s. 147.

Removal, Thinning, etc., of Trees.

Removal of Trees—The council of a county, city, township, town or village may pass a by-law for causing a tree to be removed, if necessary, but (a) it must give the owner ten days notice and recompense him for planting and protecting the tree and (b) any such tree may not be removed, even by the owner, without the permission of the municipal council. (Municipal Act, section 574, sub-section 2).

The municipal corporation shall not be liable to compensate the owner of property in front of which trees stand for their removal further than provided for in the Municipal Act, section 574, sub-section 2 (i. e., for his planting and care of them), provided the cutting and trimming is done under by-law. (Municipal Act, section 575.)

City, town and village councils may pass a by-law authorizing the board of park management, park commissioner or other officer or three park directors to remove all decayed trees and remove and transplant trees and shrubs, after giving forty-eight hours' notice to the owner, and shall not be liable to the owner; but no live tree, unless within thirty[4] feet of other trees may be removed without the consent of the owner of the property in front of which the tree stands. (Municipal Act, section 574, sub-section 5.)

[There is another inconsistency here. The following opinion as to the point was received from the Attorney-General of the province in the letter referred to in the preceding note:

'As to the removal of trees, I think the ten days notice would be confined since 1903 to the case of a township, as section 574, paragraph 4 gives power to cities, towns and villages to authorize their officers to move and cut down trees on forty-eight hours notice. If you trace the legislation back you will see how the present condition has been brought about. Paragraph 4 of section 574 was originally confined to cities over 40,000; paragraph 5 of section 574 as enacted by 61 Vict., cap. 23, sec. 19, was confined to a city of over 100,000 inhabitants. In the revision of 1903 the provisions of both these paragraphs were extended to all cities, towns and villages with the effect above pointed out'.]

Trimming Trees—City, town and village councils may pass a by-law authorizing the board of park management, park commissioner or other officer appointed, or three park directors to trim trees in parks, or whose branches extend over streets, and are not to be liable for injury to the trees if reasonable care has been exercised in the trimming. (Municipal Act, section 574, sub-section 4.)

The trimming of trees and shrubbery along the highway may be provided for by special rate under the local improvement system. (Local Improvement Sections of the Municipal Act. New.[5] Sec. 3h.)

In cities where a board of park management has been constituted, the powers of the city council with reference to the cutting down, removing, transplanting and trimming stret and park trees may be, by by-law of the council, delegated to the board of park management. (Municipal Act, sec. 74, sub-section 3.)

Penalties for destroying or injuring Trees.

Any person destroying or injuring (even tieing a horse to) a street tree is liable to a fine not to exceed twenty-five dollars ($25) and costs or imprisonment for not more than thirty days, half of the fine to go to the informant. (Ontario Tree Planting Act, section 6.)

[4] Amended from 'twenty' by 6 Ed. VI, cap. 34, sec. 22.

[5] 1 Geo. V, chapter 58.

Powers of Council to pass By-laws.

Under the Tree Planting Act (section 8) the council of any municipality may pass by-laws

(1) To regulate the planting of trees on highways

(2) To prevent the planting of any undesirable species

(3) To provide for the removal of trees planted on highways contrary to by-law.

Inspectors of Trees.

An inspector of trees, appointed under the Ontario Tree Planting Act (section 4), must, if required, report annually to the council on the number of trees planted, by whom planted, the amount of bonus due, and certain other particulars. (Ontario Tree Planting Act, s. 4.)

Insect Pests.

Councils in cities may pass by-laws to require owners of trees to destroy tussock moths, and, if the owners refuse or neglect to do so may, after giving ten days' notice, have the work done by officers appointed by them (the councils) at the expense of the owners. (Municipal Amendment Act, 1906, s. 24.[6])

Police Villages.

The Tree Planting Act may be brought into effect in police villages by thirty or more electors petitioning the township council. (An Act to Amend the Ontario Tree-planting Act,[7] passed 1899.) Inspectors of trees may also be appointed, and expenses (bonuses, inspector's pay, etc.) granted.

Linemen Damaging Trees.

A question of much importance and concern to many owners of fine shade and street trees is how they may prevent telephone and telegraph linemen from butchering their trees on the pretext of 'pruning' them, under orders from the companies employing them. On this point the same authority as quoted in the preceding editorial notes has this to say:

'I think it is quite clear that the owner would have the right to prevent a telephone company from stringing its wires in a tree planted by him in the street because under section 2 of the Ontario Tree Planting Act such a tree is deemed to be his property.

'I would refer you also to sub-section 547 of the Municipal Act (3 Edw. VII, cap. 19), which gives power to municipalities to pass by-laws to prevent the injuring or destroying of trees or shrubs planted or preserved for shade or ornament.

'It is also an offence under section 510 b of the Criminal Code to destroy or damage a tree growing in a park, pleasure-ground or garden, or in any land adjacent to or belonging to a dwelling-house, injuring it to an extent exceeding $5. See also section 533 of the Criminal Code, imposing a penalty for damage to a tree amounting to twenty-five cents.

'It was expressly enacted by 4 Edw. VII, c. 10, s. 74, that a telegraph or telephone company should not acquire any easement by prescription or otherwise as to wires or cables atttached to private property, or passing through or carried over such property, except by a grant from the owner of the property, so that no matter how long telephone wires have been attached to a tree, the municipality or the owner, if he has property in the tree, could compel the removal of the wire.'

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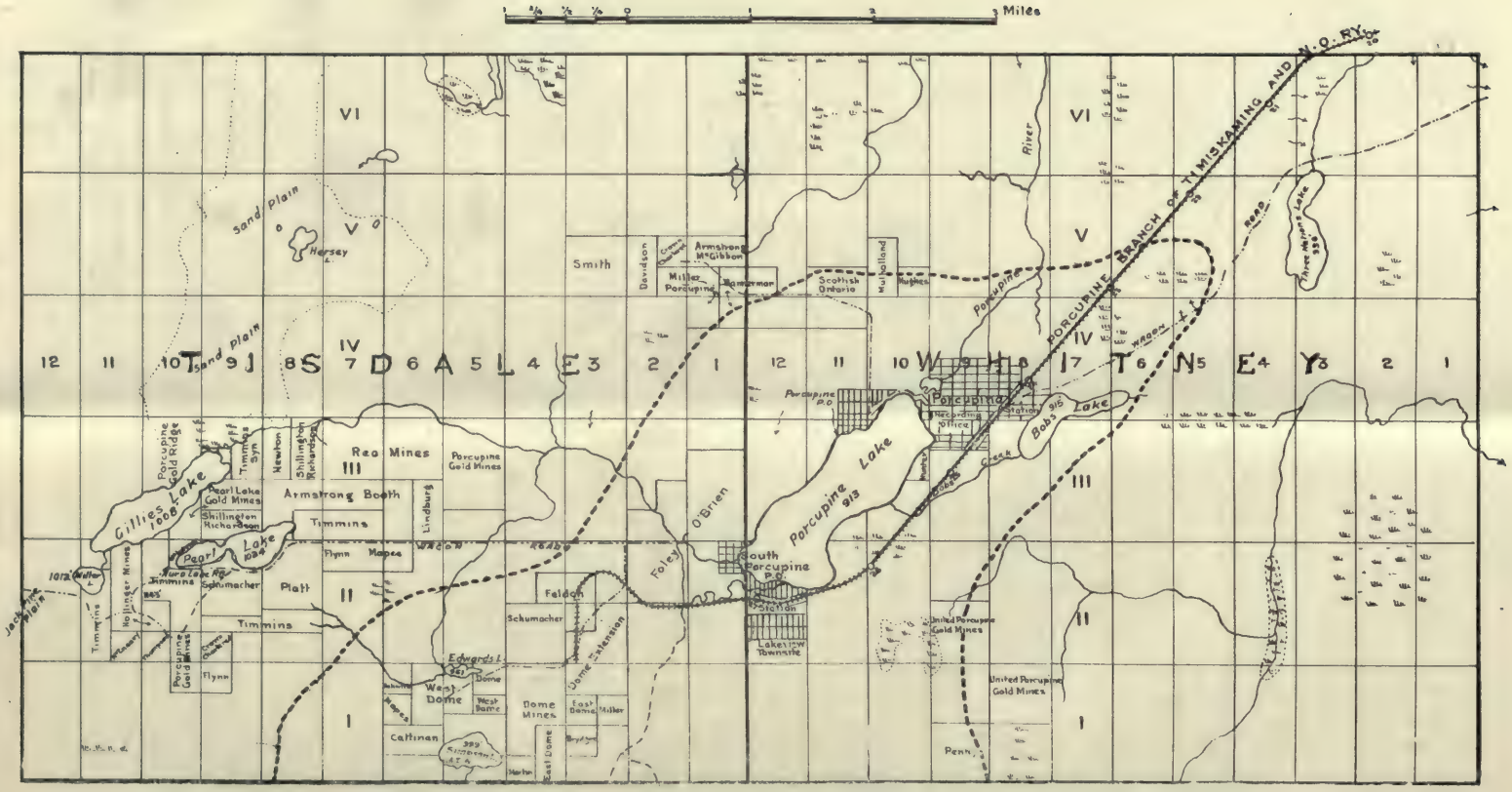
[6] 6 Edw. VII, chap. 34, s. 24. The new provision becomes s. 574a of the Municipal Act.

[7] 62 Vic. (1899), chap. 30. The new provision becomes s. 3a of the Ontario Tree Planting Act.

'Our timber limits will probably attract no attention in Germany unless considered in connection with a pulp and paper industry. The European has decided opinions upon our system of fire ranging, as it relates particularly to timber limits.' —Fred. W. Field, in paper on 'German Capital' in Monetary Times.



Map of Porcupine Fire District. Most Severely Burned District Included Within Heavy Dotted Line.

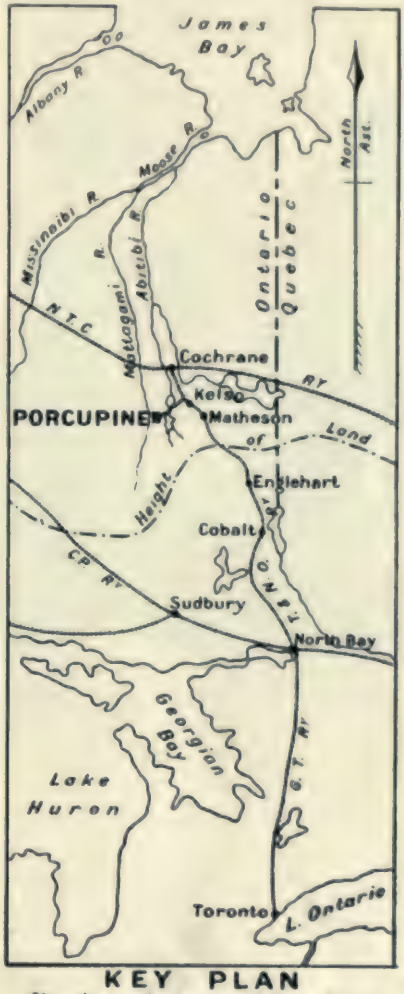
The Porcupine and Cochrane Fires

Seventy deaths and a property loss variously estimated at from a million and a half to three million dollars is in brief the story of the awful fires which centered in the vicinity of Porcupine Lake, Ontario, about four hundred and fifty miles due north of the city of Toronto. These fires occurred early in July, the climax coming on July 11. On this day also the town of Cochrane, about forty-five miles distant, was burned by another fire with a loss of three lives, and only nine buildings were left standing. The fact that these fires occurred in the mining district which is attracting at present so much attention gave them greater prominence. Porcupine is a new camp. Cobalt is about one hundred miles to the south, and the famous Timagami Forest Reserve is also to the south and its nearest edge about one hundred and twenty-four miles distant. This district is traversed by the Ontario Government Railway (also known as the Timiskaming and Northern Ontario Railway), the north terminal point of which is the town of Cochrane. At Cochrane the Ontario Government Railway intersects the National Transcontinental section of the Grand Trunk Pacific Railway.

The Earlier Fires.

The country through which the fire passed is, for the most part, level. The characteristic forest growth of the region is birch and poplar, the ground is covered with a thick carpet of moss and the undergrowth is abundant, almost luxuriant. One of the greatest means of rapidly spreading a fire in such a forest is the thin, light bark of the birch; it catches fire in an instant, and a blazing sheet of it may be carried half a mile or more, to start a new fire far ahead of the old.

Owing to the extremely dry weather small fires had been quite frequent in the district in the latter part of June and early July. The townships most affected were Tisdale and Whitney, and to a smaller extent Shaw, Bristol, Deloro, Langmuir, Eldorado, Ogden, McArthur and Cripple Creek. On July 1 there were fires about the village of Porcupine at the north end of the lake and at South Porcupine at the opposite end, and along the line of the Ontario Government Railway. The Dome group of mines in the south part of Tisdale township were throughout the centre of the worst fires. On July 1 the buildings at the North and West Dome Mines were destroyed, and at the Dome Extension several men, including the mine captain, were injured fighting the fires. At McDougall townsite all the buildings were burned; all the people were rescued in gasoline launches, but those who could not be taken away on the first trip were compelled, while waiting for the return of the launches, to stand in the water up to their chins. The fire extended to Pearl Lake in Tisdale township and the Pearl Lake Mining Company's plant was wiped out. On the following day a few shacks were burned at South Porcupine and at



KEY PLAN
Showing relative position of the
PORCUPINE GOLD AREA.
Toronto to Kelso is 449 mls

Golden City, and at the Dome Extension Mines the whole force had to go down the mine in order to save themselves. Hon. Frank Cochrane, Minister of Lands, Forests and Mines, Mr. J. L. Englehart, Chairman of the Ontario Government Railway Commission, and Mr. Denis Murphy, Member of the Commission, who were on a trip of inspection, had a rather narrow escape.

On July 4 smoke was to be seen in all directions and prospectors coming in from Bristol township said the township was fire-swept, three men were dead and the rest had escaped after abandoning everything and fleeing for their lives. All that week fires continued to be seen and the dry weather aided in their spread. On Sunday, July 9, the smoke was so dense in Porcupine that it was impossible to see across the street. A few shacks were burned, but the main part of the town was saved owing to a large clearing to the west. At Pottsville, adjoining South Porcupine, the Presbyterian Church and a number of houses were destroyed, at an estimated cost for this day of $20,000. On the same day another fire caused $35,000 damage at Kelso, on the main line of the Ontario Government Railway, and about twenty miles distant from Porcupine.

Fire Sweeping Down on Porcupine.

The Great Disaster.

Finally, on July 11, the climax came, and the fires, which had so long been threatening, descended on the unfortunate towns and in the course of a couple of hours left heaps of ruins and many dead. The story is concisely told in the following despatch:—

'Early in the morning dense clouds of smoke could be seen in the southwest, but the fire was apparently remote. A small fire also broke out in Lakeview, adjoining South Porcupine on the south, but this excited little notice because of the frequency of bush fires. As noon approached thick clouds of smoke reached the zenith, marking the approach of the fire, and soon the sun was obscured. At 2.30 the fire had covered an area of 25 miles in length and over two miles in width and had reached the base lines of Tisdale, destroying the Standard and Imperial mines in Deloro township, Philadelphia in Shaw township and the Eldorado and United in Southern Whitney. At 1.15 p.m. the seriousness of the situation was realized in South Porcupine.

'The fire call was sounded on the Dome mine whistle, with repeated blasts from other whistles. By this time the sky was black with smoke, and residents began to pack valuables and light baggage for a hurried departure. Soon the flames had reached the Foley and O'Brien mine, having enveloped the Preston East Dome, the Dome, West Dome, North Dome and what remained of the Dome Extension after last Sunday's fire. In half an hour the outlying shacks had ben reached. This was the beginning of the end.

'It became apparent at once that the town and possibly all the inhabitants were doomed, for the width of the fire was sufficient for it to sweep over the entire

town of South Porcupine and around both sides of Porcupine Lake. The fire reached the frame buildings of the town with a roar heard for miles.

'In twenty minutes South Porcupine was completely in flames and in three hours there were but corpses and smouldering embers, where the most flourishing town of the camp had stood. Men, women and children crowded to the water front. Launches and canoes, scows and boats were pressed into commission, and the women and children were first packed into the boats and sent to Pottsville and Golden City, both safe at that time. Panic and chaos prevailed. Men fought with each other for their families, and Police Officer Murray with Jack Gardner had to stand off the panic-stricken foreigners who rushed for each boat as it came in. Men were hurled into the water and many rushed in as the only place of safety. Thirty launches and as many canoes soon had the women landed in safety on the other side of the lake.'

Those who could not escape from the burning town in the launches sought refuge in the lake, some six hundred men, women and children standing for several hours in the cold water. These were confronted with another danger, for horses and cattle, maddened by the flames, rushed into the lake, trampling some and forcing others out beyond their depth. The high wind which always accompanies forest fires of this magnitude made the lake very rough and a good many of those who sought refuge in canoes and boats lost their lives through the overturning of these craft. At first it was reported that two hundred had met death in this way but later reports showed that this was much exaggerated.

Golden City, which from its position around another angle of the lake was supposed to be safe, did not altogether escape. Fire entered from the north and burned about one third of the town, including several churches and the best residences.

The fires, after the terrible destruction of this day, subsided, largely from lack of material and a heavy rain on July 19 and 20 extinguished the smouldering remains.

Inhabitants of South Porcupine driven to the Lake.

Causes and Consequences.

Various causes have been assigned for the fires, but it is generally believed to be due to prospectors' camp fires. It is known that prospectors are not averse to having the ground cleared and it is believed that when the fires became general many prospectors lighted 'back fires' to secure their own safety and thus aided in bringing on the general conflagration. That the miners did not look upon the fire as an unmixed evil (in spite of its terrible toll of human life and the property loss) is shown in the following extract from a mining circular which was headed 'Disaster a Benefit':—

'What of the future? Under the circumstances, one almost hates to tell the truth about the effect of this disaster, but already there is evidence that this fire means a still greater Porcupine. The forest was a menace and brought no benefit, except that mine timbers were more easily obtained and every property was furnished fuel to the extent of the timber on its claims. This was limited. A first-class mining plant would speedily eat up the timber of a 40-acre tract. Aside from this, the forest was of practically no benefit. The trees and underbrush impeded progress and made fire a constant danger. Every company was engaged in clearing its property of timber. The fire has done the work for them. The timber and underbrush helped to conceal the geological formation. The burning of the brush will expose many hitherto unknown veins of gold-bearing rock.'

That the lumbermen entirely reject this view (even though the timber burned was not of a valuable species) is shown in the tenor of a number of articles in the lumber press. A writer in the Canada Lumberman signing himself 'Bush-ranger', after severely criticizing the present Ontario fire-ranging system, goes on to argue that were there a properly equipped brigade to support the patrolmen with detachments stationed at convenient points the fire could have been successfully fought before it attained the dimensions of a conflagration. He points out that numerous fires were observed on July 4 and yet the damaging fire did not occur until July 11. He says 'Apparently no vigorous steps were taken to quell the outbreak or to minimize the danger during the week they were burning. Had there been a properly equipped brigade stationed, say at North Bay, it could have been despatched to the scene by a special train, or otherwise on Tuesday, July 4, and possibly a large timber area might have been saved from destruction, and certainly something might have been done to put adjacent towns out of jeopardy.'

The Fire at Cochrane.

At Cochrane fires had been noticed burning in the vicinity on Tuesday morning, July 11th, but little attention had been paid to them. Very suddenly, however, the wind changed, and brought the fire rushing down on the town, which it reached about three o'clock. For an hour or two previous the people had been busy getting their belongings to places of safety. A train was in readiness which pulled out to a clearing some distance from the town, and separated from it by spaces of sandy land and by Lake Commando, which the fire was unable to cross. About six o'clock, when all danger was over, the train returned to town. Immediate relief was given by Foley and Welch, railway contractors, turning over their supplies, which lasted for some time.

Explanation of the Maps.

A glance at the accompanying maps gives an idea of the relative position of the towns and properties damaged. Wtih the exception of Cochrane, the towns are all situated on Porcupine Lake, a sheet of water some two miles in length by half to three-quarters of a mile in width. At the southwestern end of this is the town of South Porcupine, with Pottsville almost adjoining it a little to the west. At the other end of the lake are the towns of Porcupine and Golden City. The fire approached from the southwest, and the area which sustained the greatest damage is that in which the various Dome mines were situated. At the West Dome mine the loss of life was greatest, some twenty-one bodies being taken from a timbered shaft in which a number of the staff of the mine had taken refuge. At the Preston East Dome mine, on the other hand, where a number of persons took refuge in a shaft which was not timbered, no loss of life took place. From the shaft of the Big Dome mine, also, six bodies were recovered.

Relief Work.

Supplies were speedily voted by a number of Canadian cities and towns, including Toronto, Ottawa, Hamilton, Guelph, St. Catharines and others, and by Boards of Trade, private firms and individuals. The American Red Cross Society also sent a contribution of a thousand dollars. One Toronto departmental store sent a carload of provisions; a feature of this gift which the relief committee found of advantage was that the goods had been made up into parcels before shipping, which made the distribution of them comparatively easy.

Up to July 27th the total amount of relief distributed by the relief committee was $23,443, of which Porcupine received $13,855 and Cochrane $9,588. In addition $10,000 was set aside for the establishment of a hospital in the Porcupine district, and $1,000 for the establishment of temporary schools in the Porcupine district.

Reporting on his last summer's work in locating the eastern boundary of the Rocky Mountain forest reserve, Mr. P. Z. Caverhill remarks: 'Fire is the worst enemy the forest has. Eighty per cent. of the territory surveyed has been burned in the past fifty years, and sixty per cent. of this (or forty-eight per cent. of the entire country) has been burned over in the last twenty-five years.'

Bringing in Bodies to the Cemetery at Deadman's Point, near Porcupine.

Other Forest Fires of the Summer of 1911.

The awful forest fire at Porcupine, Ontario, has naturally claimed the most attention among all the forest fires of the year. Not only in other parts of the Dominion of Canada, however, but in the United States and in some foreign countries the season has been marked by large fires and consequent destruction of life and property.

Nova Scotia.

The province of Nova Scotia has suffered to an unusual extent during the past summer. In addition to the severe conflagrations which occurred towards the end of May last in Shelburne and Cumberland counties, a very severe fire raged near Amherst during the first part of July, originating near Fox River. This was claimed to be of incendiary origin, the fire having been set in three different places and in parts of the forest not frequented by sportsmen. By July 21st it was estimated to have run over more than 6,000 acres of the holdings of one company alone.

British Columbia.

About July 20th a fire raged near Squamish, near Vancouver, the loss from which was reported to be half a million dollars. A few days previous a serious fire was reported a few miles east of Yale, which proved troublesome, and also a fire west of Lake Coquitlam.

United States.

In the state of Michigan, during the early part of June, several towns were destroyed, and the death list amounted to seven. The middle of the month was also marked by severe fires in the Moosehead district, Maine. Thousands of acres of Maine's finest timberlands were reported to have been burnt over, with a loss of hundreds of thousands of dollars. Some of these fires are said to have been caused by lightning.

Foreign.

During May last immense forest fires occurred on the island of Hokkaido (or Yezo), Japan. A number of villages are reported to have been destroyed, and many lives lost. The fire line was almost sixty miles in length.

Sweden also reports serious forest fires during the last of May, near Umea, in the province of Vesterbotten. Some deaths are reported.

Conservation and Homemakers.

Signs which show that the women of Canada are awakening on this subject.

Five years ago 'conservation' was an unknown term in the sense in which it is now applied. There were no newspaper articles on it and no addresses, except those of a few enthusiasts. Now it is scarcely possible to open a newspaper without finding some reference to the subject. One of the most hopeful signs is the way the women of Canada are taking hold of it. Women's organizations are among those which most frequently ask for lectures under the Canadian Forestry Association's lecture plan. Authorities on the subject are constantly being called upon by the women to explain the relation of conservation to the home.

Mr. J. F. MacKay, general manager of the Toronto Globe, and a member of the Canadian Commission of Conservation, by request recently spoke before the Toronto Household Economic Association.

Probably the most important gathering of the century, said Mr. MacKay, was the conference of governors, judges and scientific men which Theodore Roosevelt called together at Washington in May, 1908, to form a National Commission on Conservation. Sometime later the Canadian government decided to appoint a permanent commission, and the first meeting was held at Ottawa, January, 1910, the Commission being national, rather than political, in its aims.

The Commission is attempting conservation along seven lines, and leading experts in each branch are directing the work. The question of forestry, and the preservation of our forests, had been most in the public eye, and whereas a few years ago there was not one qualified forester in Canada, chairs of forestry were now established at three universities. The evil results of bad lumbering in the injuring and cutting down of immature trees, the devastation by fire of vast areas of forest, were well known. Along with prevention of these two evils should come proper treatment of forestable land.

He dealt also with the conservation of fisheries, mines, soils and the public health, and concluded by speaking of the value of our fresh waters—not only for sustaining animal and vegetable life, but for purposes of navigation and electric power. The use of our waters as a mean of disposing of sewage, he characterized as a 'monumental misuse.' From our waters we could obtain heat, light, and power. It had been estimated that our Canadian waters can give sixteen million horsepower. Of this, only five hundred and fourteen thousand was as yet developed.

Mrs. Annie A. Wilder, a Canadian now resident in Washington, and an enthusiastic supporter of conservation, some time earlier was the guest of the Winnipeg Women's Canadian Club, and in the course of her address showing how closely related the home was to the preservation of the forests said:

'Forest preservation is a moral question. The waste of our national resources, whether in Canada or the United States, is not only criminal but immoral. I agree with Andrew Carnegie when he says that the land has been given us in trust; that we have a duty to succeeding generations in preserving the land and all its resources, and it is to this end that I am an active conservationist.'

(Courtesy American Lumberman.)

Cut of Yellow Pine 100 Years Old, with 'Standards' Left.

Notes on Some Bavarian Forests.

By Major Gustave Joly de Lotbinière.

A brief account of a short visit paid to three Bavarian forests, near Munich, may be of interest to those who may contemplate a visit to Germany, where they will see for themselves the result of more than a century's systematic and scientific management of forest lands.

I desire, at the outset, to make it clear that German forestry is not identical with forestry as it exists to-day in Canada, although it is remarkable how similar the forest trees and climatic conditions are in these two countries.

The main difference lies in the fact that in Canada primeval forests abound, whereas in Germany nature is assisted in the work of regeneration both by planting and by selecting the trees to be removed, as well as those to be left as seed-bearers and shelter for future crops.

On my arrival at Munich, in the middle of August, I presented a letter of introduction to the British Legation. (I had previously ascertained that Professor Heinrich Mayr, who is a well known authority on forestry, would be the best authority to consult). The Legation placed me immediately in communication with him and I lost no time in calling at his house in the experimental garden, at Grafrath. The Professor received me with the greatest kindness and courtesy, and undertook to arrange a programme which would fill up the whole of the time at my disposal. I cannot say too much of the interest shown me by Professor Mayr, who is the principal authority in the School of Forestry at Munich, as well as the head of the large Experimental Garden at Grafrath.

[Prof. Mayr has died since Major Joly de Lotbinière's visit to Munich.

A short obituary notice will be found elsewhere in this issue.—*Ed.*]

My wife and I spent a delightful afternoon with the Professor at Grafrath, as a preliminary to a future visit on the following Tuesday, as it was our intention to proceed to Ober-Ammergau for Sunday, to see the famous Passion Play, which is held on Sundays and saints' days, during the summer of every tenth year.

Ober-Ammergau is beautifully situated in the Bavarian highlands, adjoining the Austrian Tyrol, and for its own sake is well worth a visit.

Here, as in other parts of Germany, advantage has been taken of natural conditions and environment, as the hillsides afford a splendid opportunity of growing trees as a profitable crop. Land which cannot be tilled economically will very often grow trees of great commercial value and supply material for numerous industries. Mountain slopes afford an excellent opportunity for profitable forestry, of which full advantage has been taken, and nature is everywhere being assisted in Germany to maintain a supply of timber to meet the requirements of the country.

Prof. Mayr's Tree Garden.

The Experimental Garden at Grafrath is 140 acres in extent. It is situated on a terminal moraine, varying, within short distances, from heavy clay to sand and gravel soils and is not, generally speaking, suited for agricultural purposes and consequently has been very rightly turned over to forestry.

The object of the garden is to study the characteristics of indigenous trees and to study at the same time what exotics may be most profitably cultivated in Bavaria. The size of the garden is sufficient to enable large numbers of each species to be grown under natural conditions. The garden is traversed by numerous footpaths which makes the inspection of the many varieties of trees very easy.

The following has been taken verbatim from the printed report of the Royal Scottish Arboricultural Society's excursion to Bavaria (1909) and has been included to show the importance attached by the Society to experimental gardens on a large scale:—

"In the cultivation of exotic species, mistakes are frequently made which lead to failure and disappointment. A certain amount of knowledge in regard to the cultivation of an exotic may be, and often is, obtained from failures or negative results. This method of investigation, however, savours too much of the old method of trial and error. Such a method of experimenting is slow and costly, and the environmental conditions are so varied that in such cases it is difficult, nay, almost impossible, to determine which factors are beneficial and which injurious. The case is quite different in a properly arranged experimental garden, where experiments can be conducted on scientific principles. Professor Mayr's work has shown that a knowledge of the trees in their native habitat is one of the first essentials in dealing with the introduction or cultivation of exotics. A knowledge of the physiology and geographical distribution of the various species indicates the lines upon which experiments should be conducted, and this can only be done in a properly organized experimental garden.

* * *

The garden was laid out in 1884, so that sufficient time has elapsed to enable some valuable deductions to be drawn. The Douglas fir flourishes in Bavaria, as it does in England, especially the Oregon or light-green variety, which grows much faster than that from Colorado.

The experiments made with the Japanese larch clearly demonstrate the importance of careful scientific investigation. This tree grows re-

markably fast for the first fifteen years, but after this period is caught up with and passed by the native variety.

The value of larch as a timber tree is universally acknowledged, but it has suffered much from disease in Europe, consequently varieties from other countries have been tried in order to find one which would be immune from the very prevalent larch disease.

Canadian hemlock is another tree which is being experimented with on a large scale. Professor Mayr was of opinion that it was a fast grower. As hemlock is an exotic to Europe, its cultivation is being followed with interest.

(Courtesy American Lumberman.)

Thirty-year-old Coppice near Karlsruhe, Germany.

Cultivated Trees.

The Canadian or Weymouth white pine (Pinus strobus) has been cultivated in Europe for over a hundred years, and is now classified as a native tree.

The Bavarian spruce (Picea excelsa) is probably the most cultivated forest tree in Bavaria; the needles have not nearly so strong a scent as the Canadian variety (Picea canadensis). The roe deer will not feed on the latter, although they do considerable damage to the native variety.

When sylviculture is studied from its commercial aspect it is interesting to note how small is the number of species which are cultivated in Bavaria, and how alike they are to the commercial trees of Eastern Canada.

The spruce is by far the commonest tree and is called by German foresters "the bread-winner." The silver fir (Abies pectinata) is also common. The Weymouth pine and also the Scotch pine (Pinus sylvestris) are the most important pines cultivated. These, with the larch (Larix europea), practically complete the list of conifers.

I understand the oak, ash, beech and sycamore are the most important of the deciduous trees (possibly birch and alder might be included in this list) but I did not visit any hardwood forests.

A German Forest.

Forstenrieder Park was the first forest we visited. It is situated about fifteen miles south of Munich. We saw some of the wild boar which are

preserved by the King of Bavaria. We were met at the station by one of the forest guards, who took us through a portion of the forest to the nursery, where his chief, the Assessor, met us. This was our first experience of an artificially planted forest and we were much impressed by the extraordinarily regular growth of the trees — acres upon acres of tall straight stems of clean growth, free from all lower branches.

There was no underbrush of any kind, nothing but tall stems about four to five metres apart, growing out of a carpet of damp moss, with a perfect canopy overhead without gaps or breaks. It is a very impressive sight to see so regular a crop of timber, practically all of one species (spruce in this case).

The roads are carefully laid out at right angles and at regular intervals to give convenient access to all parts of the forest.

To describe the appearance of this forest it is necessary to say a few words on the rotation system, which is so universally practiced in scientific forestry.

This principle is founded on the clean-cutting of a fixed portion each year and its immediate replanting, either artificially or by natural regeneration. To carry this out, in a logical manner, it is necessary to cultivate the varieties which mature within a certain time. The usual practice with spruce, in Bavaria, is to take from 90 to 100 years as the time necessary for a crop to complete the quickest and consequently the most profitable portion of its growth, by the end of which period it will have reached a diameter of sixteen to twenty inches at the butt. If left longer the trees would still increase in size, but at a rapidly diminishing rate.

Having decided upon the variety and the time required for its development into profitable timber, the next step in creating an artificial forest on the rotation system is to plant an equal portion each year until the whole is planted up in the period allowed for the timber to reach its profitable development. Thus if you have 1,000 acres to plant in spruce, which you propose to cut at the age of a hundred years, you would plant ten acres a year, until the whole was planted. The first clean cutting would only begin at the end of one hundred years, when the oldest ten acres would be cut and immediately replanted; every succeeding year another ten acres would be cut and immediately replanted. Having once established your forest, you may thus count upon ten acres of fully developed trees every year, for all time to come.

The above is a brief statement of the rotation principle, leaving out of account such questions as the number of trees to be planted to an acre, the extent to which, and age when, thinnings should be made and whether the replanting should be done artificially or by natural regeneration.

Forstenrieder Park is a very perfect example of a forest artificially planted on the rotation system. Trees are seen at all stages of growth, from fully developed trees, ready to cut down, to seedlings only just planted.

Forest Planting.

The young trees are reared in a nursery in the forest itself, under as natural conditions as possible. They are planted out in rows, at the age of two to four years, and at regular intervals of four feet each way, or about 2,700 trees to an English acre. The object is to create a perfect canopy as quickly as possible, the branches meeting at an early age and the upward race starting at the outset. As time goes on the stronger trees overtop and crowd out the weaker ones, an overhead canopy is formed which causes the lower branches to die off, and tall clean stems are the result.

Thus, in a German forest, nature does its own work and no artificial

pruning is necessary; but, when the trees are about thirty years old, science is called in, as the trees will have to be given more room to enable them to thicken their trunks, and, by increasing their girth, to put on wood where it will be of most value to the lumberman. Thus, the required length of trunk having been attained at an early age, it is now necessary to remove the weaker trees in order to give the stronger ones more room to develop their trunks.

Thinning.

The guiding principle, in thinning out, is to avoid the breaking of the overhead canopy or the opening out of the forest to such an extent as to let in too many cold draughts, as the trees have been reared under shelter and will thrive best if the shelter is maintained.

I believe success depends, to a great extent, on judicious thinning, which is done every ten years or so, until the trees have reached maturity, when the final cutting will be done.

Professor Schlich in his Manual, Vol. II, page 209, 2nd edition, gives the following figures for a mixture of Scotch pine, beech and spruce in the Black Forest:—

Age in years.	No. of trees to acre.
20	3,960
40	1,013
60	449
80	346
90	262

The Forest at Isen.

The next forest we visited was at Isen, about thirty miles east of Munich. A branch railway runs through this forest.

The Forest of Isen is about 6,000 hectares (15,000 English acres) in area. As at Forstenrieder, so here, I was much impressed both by the uniformity of the trees in size, and by the regularity of their distribution. The land appeared to be carrying the maximum amount of timber, all of which seemed to be clean and healthy. I was also struck by the number of saw-mills distributed along the outskirts of the forest. With the local industries on the spot, the cost of haulage is reduced to a minimum; and the amount of permanent local employment provided must be considerable; when a tree is cut down,

(Courtesy American Lumberman.)

Planted Spruce in Saxony, 10, 20, 30 and 50 Years Old.

even the branches are removed and made use of, and no waste wood is seen anywhere .

The woods were mostly spruce and Scotch pine, with a fair proportion of Weymouth pine and some Douglas fir.

The administrative staff at Isen consisted of a forest-master, two assessors and seven foresters, all highly specialized in their respective duties; and, I understand, all have to pass through one of the schools of forestry.

Forest Nurseries.

We visited two nurseries situated in the forest itself. A brief account of the methods employed for raising seedlings may be of interest.

The seed is sown in rows a metre long; between the rows laths about two inches wide are laid on the ground, to keep the weeds down and to keep the soil damp.

The number of seedlings raised by this method, in a small space, is prodigious. The nurseries are, consequently, small in area: the beds are carefully prepared beforehand, and lupins or some other soil-improving crop is first grown to enrich the ground.

The seedlings are generally left in the seed beds for two years, and are then planted out in the nursery three inches apart, where they are left for another two years, after which they are ready for transplanting into the forest. Although these details may appear trivial, they are exceedingly important as, unless the young plants are given just the right space for forming both roots and heads, they will not be in the best condition for moving. We saw young trees which had been badly started in the nursery and were, consequently, useless for moving out.

Each variety of forest tree has been studied and has been found to require different treatment in the nursery. Thus, the oak and ash seedlings are planted out in the nursery twelve inches apart and the Weymouth pine six inches apart; the young spruce, as stated above, are planted three inches apart.

The transplanting is done both in the autumn and in the spring.

The Germans have, with the greatest care, designed tools for their forestry work. I saw a most useful auger for taking up the two to four year seedlings, with a ball of earth. They have also a very ingenious arrangement for making the holes for the two-year-old seedlings, when first moved.

These devices economize labour and secure uniformity.

The cost of planting an acre of forest, under normal conditions, is only about ten dollars. Unfortunately we were not in Bavaria at the right season for seeing the planting operations.

I understand that, for a forest of the size of Isen, (15,000 acres) about 200 acres are replanted every year, the trees being planted in rows at intervals of four feet each way.

In Germany, where forestry has been developed to a great pitch of perfection, all possible care is taken to secure the best seed obtainable.

Forest trees produce full crops of seed at comparatively long intervals, from ten to twelve years; and some years are much better seed years than others. Seed is collected from carefully selected trees; but, on this question, I was unable to collect much information. I believe the seed is often sent from one part of the country to another. I was informed at Isen, however, that in future they would collect their own seed.

Natural Reproduction.

The third and last forest that we visited was at Kelheim, about six hours' journey by train, from Munich. Kelheim is a very important forestry centre, and would be well worth an extended visit; it is particularly interesting because natural regeneration is practiced here on a large scale. We were unable to do more than drive along some of the

forest roads and stop a short time at several places to see the process of natural regeneration by the group system.

The group system of regeneration is worked as follows: When an area is selected for final cutting, the trees are removed in circular patches of about fifty yards in diameter, a mother-tree being left here and there for seeding purposes and shelter. The clearings are comparatively close to one another, say, within fifty yards; the object of keeping the clearings so small is to avoid exposing the ground too much to the sun and light, which encourages the growth of grass and weeds, whereas the young seedlings do best under shade. In about four years' time, if the clearings have been made at a favourable time when the mother-trees are producing seed crops, the ground will be covered by a thick crop of young seedlings. When this has been accomplished, a second cutting is made; this is done by enlarging the circular patches, and cutting out a ring round each circular patch, so that the circular clearings are now almost touching each other. Another period of four years is allowed to lapse for the newly cut ground to become covered with seedlings. When this has been accomplished, the remaining trees are removed with the exception of, perhaps, a few trees to complete the sowing of any bare portion; or hand planting is resorted to, in order to fill in gaps.

The above is a brief description of regeneration by the group system. As I saw it at Kelheim, it appeared to be working admirably and there was a splendid crop of young spruce coming up where the ground had been cleared.

There are other methods of regeneration, such as cutting out long narrow strips, which, in time, will be restocked from seed, carried by the wind. The strips should be narrow to prevent the growth of grass and weeds; all bare patches that have not seeded well are hand-planted.

The Germans lay considerable stress on shelter, and always begin cutting on the leeward side, away from the prevailing wind. They also, when afforesting an exposed or cold site, provide some shelter trees, such as birch, to protect the young seedlings, especially in cases where land is being prepared to receive a forest crop for the first time.

I am of opinion that, if nature is assisted by science in the natural regeneration of forest lands, which have been allowed to deteriorate, much labour, time, and expense will be saved.

It is possible that this branch of the subject might be profitably studied and applied to conditions, such as exist in Canada to-day, and that vast areas in Canada might be reforested with valuable timber by the practical application of scientific principles.

In fact, I might go further and state that it will be practically impossible to reforest a great deal of what was former forest land in Canada, without assisting nature by the application of methods which have been devised by close scientific study.

THE NEWLY-APPOINTED BISHOP OF REGINA.

Hearty congratulations will be extended by the members of the Forestry Association to Right Reverend Mgr. Mathieu, late rector of Laval University, Quebec, on his elevation to the bishopric of Regina. Mgr. Mathieu was, at the last annual meeting of the Canadian Forestry Association, elected to the directorate in the place of the late Mgr. J. C. K. Laflamme. Not only has Mgr. Mathieu attained a high degree of honor in academic circles, having received the degrees of doctor of theology and doctor of philosophy, but he has also been honored with the distinction of C. M. G. and is a Knight of the Legion of Honor of France.

Attention is called to the advertisement for a woods superintendent in another column.

Comment disposer des débris et déchets provenant des exploitations forestières.

(Travail de feu M. E.-G. Joly de Lotbinière, lu à la convention forestière canadienne à Québec, janvier, 1911.)

Parmi les nombreuses précautions à prendre pour empêcher que nos forêts ne soient détruites par le feu, il y en a une à laquelle jusqu'ici on a porté peu d'attention, bien qu'elle soit de la plus grande importante. Je fais allusion à la façon de se débarrasser des débris ou déchets qui recouvrent le sol après la coupe des arbres.

On peut employer trois méthodes pour se défaire de ces débris:

Premièrement—en les détruisant par le feu.

Secondement — en coupant les rameaux des grosses branches pour les empiler isolément avec d'autres déchets, en prenant soin d'éloigner les piles les unes des autres autant que possible.

Troisièmement — en jonchant le sol de rameaux coupés aux grosses branches des arbres d'abatis.

Je vais dire en peu de mots ce que je pense de ces trois méthodes, dont j'ai personnellement fait l'essai, afin de me rendre compte, aussi soigneusement que possible, de celle que l'on devrait préférer, sans qu'il en résultât des dépenses pouvant rendre impossible l'exploitation des forêts.

J'ai donc constaté qu'aux endroits où le bois abonde, sans être de trop fortes dimensions, deux bons "gars" peuvent abattre et débiter en billes une moyenne de 4,000 pieds de bois, mesure de planche, par jour. Ces 4,000 pieds de bois représentent environ 100 billes de 40 pieds par bille en moyenne. Or pour ébrancher ces 100 arbres, allumer des feux et les alimenter avec des branches, il a fallu quatre hommes payés $1.25 chacun. Soit une dépense de $5 pour les quatre, et $1.25 à ajouter au coût de revient de chaque 100 billes ou 1,000 pieds de bois exploités en forêt.

Dans le second cas, pour couper les rameaux des branches et les mettre en piles isolées, deux hommes ont pu accomplir ce travail à raison de 62 cents par 1,000 pieds; tandis que pour couper les rameaux et en joncher le sol il suffit d'un homme dont le travail revint à 31 cents par 1,000 pieds.

Bien que sur ces trois méthodes la première oui consiste à brûler tous les débris soit la préférable, elle est cependant trop coûteuse pour que les exploitants de bois y recourrent, attendu que l'on trouverait excessif d'ajouter $1.25 au coût de revient des billes. Certes, si les débris étaient mis en piles en hiver et brûlés en été, il en coûterait peut-être moins cher. Mais le risque de mettre le feu à des bois épais, tels que le sont nos forêts d'épinette, rendrait cette expérience fort dangereuse. Quant à brûler les débris l'hiver, cela se pourrait et l'on devrait s'y résoudre, si la chose pouvait être faite économiquement. Malheureusement le temps qu'il faut pour chercher du bois sec et pour faire un grand feu à même de brûler les frondaisons, rend coûteuse cette méthode qui serait la meilleure et la plus sûre.

Pour ce qui est de la seconde méthode, qui consisterait à mettre les débris en piles isolées au coût de 62 cents par 1,000 pieds, elle est aussi, je crois, au-dessus des moyens des exploitants de bois, d'autant plus qu'elle ne présente pas les garanties de sécurité voulues. Ceci,

parce que les piles de branches présenteraient plutôt du danger en cas d'incendie, que des facilités pour combattre le feu.

Quant à la troisième méthode, celle qui consisterait à couper des rameaux des branches et à en joncher le sol de la forêt, elle me semble la plus pratique et la plus économique pour se débarrasser des débris d'abatis. En tout cas la dépense additionnelle de 31 cents par 1000 pieds pour obtenir une grande somme de sécurité, ne doit guère être au Canada un obstacle sérieux à l'adoption de cette méthode. Si je ne me trompe, on la pratique déjà sur une grande échelle et avec les meilleurs résultats aux Etats-Unis. Le pourquoi de la préférence accordée à cette méthode est évident, si l'on songe que lorsque les déchets sont éparpillés sur le sol de la forêt ils se brisent et cessent promptement d'être une source de danger, surtout dans cette partie du Canada où de fortes neiges les exposent toujours à l'humidité parmi les mousses et l'humus. Aussi si un incendie éclatait dans une région déboisée où l'on aurait pris cette précaution, tout au plus se bornerait-il à brûler ce qui se trouve sur le sol et serait, partant,beaucoup plus facile à éteindre que s'il était alimenté par des branchages ou des piles de branches.

Avant de terminer ces quelques remarques, je désirerais attirer votre attention sur une autre cause de danger. J'ai nommé les arbres morts qui restent debout et que l'on devrait abattre surtout lorsqu'ils sont pourris. Car, en cas de feu de forêt ces arbres deviennent redoutables, surtout lorsqui'ils sont creux, du fait qu'ils se transforment alors en immenses cheminées, qui jettent des flammes et des étincelles au-delà de la zône ignée, qu'ils agrandissent en laissant tomber leurs débris enflammés en maints endroits à la fois. C'est pourquoi la tâche de combattre les incendies de forêts, qui déjà en soit est difficile, devient alors souvent impossible lorsque les arbres morts restent sur pied.

En ce qui me concerne je dois avouer que jusqu'à présent je n'ai pris dans mes exploitations forestières aucune des précautions dont je viens de parler. Néanmoins les résultats que j'ai acquis au cours d'expériences faites cet hiver, m'ont décidé à adopter à l'avenir au moins la méthode de couper les rameaux et d'en joncher le sol. Je me plais donc à espérer qu'avant longtemps une entente à ce sujet interviendra entre nos divers gouvernements et les propriétaires de limites à bois, afin que ceux-cise déci dent à adopter une méthode leur permettant de se débarrasser des déchets produits au cours des exploitations forestières.

MEMBERSHIP LIST.

The attention of members of the Canadian Forestry Association is called to the fact that the mailing list has lately been revised with great care, and is now so arranged that changes can be quickly made. Should any member be receiving his copy incorrectly addressed, or have missed any number of the Journal, the Secretary would be glad to receive notification of his correct address or of the omission. He is also desirous of receiving changes of address as soon as possible, so that the list may be kept up to date.

FEDERAL CO-OPERATION IN FIRE PROTECTION IN THE U.S.

The Department of Agriculture of the federal government of the United States has lately entered into an arrangement with several of the states, by which grants are made to the individual states to assist them in protecting their forests against fire. The funds so granted are to be used solely for paying patrolmen, and a very carefully planned system of patrol has been instituted. The arrangements have been effected under the terms of the Weeks bill, which also made possible the establishment of the Appalachian and White Mountain forest reserves. The states which will recive federal aid, with the amounts contributed by the federal government, are as follows: Maine, $10,000; New Hampshire, $7,200; Wisconsin, $5,000; Vermont, $2,000; New Jersey, $1,000.

The Pacific Coast Logging Congress

The third annual session of the Pacific Coast Logging Congress was held at Vancouver, B. C., June 22 to 24, 1911; this was the first session of the congress ever held in Canada. The Vancouver Hotel was the headquarters of the congress, while the sessions were held in the Imperial Rink. The attendance was a large and representative one, some two hundred signing the register.

The first session opened at 10.30 on Thursday morning, June 22, the president, E. P. Blake, of Seattle, Wash., presiding at this, as at subsequent sessions. The first item of the morning's program was an address of welcome, which was read by J. A. Smith, president of the British Columbia Loggers' Association.

The president and the secretary-treasurer (Geo. M. Cornwall, of Portland, Oregon) then gave their annual addresses, touching on many matters of interest to the congress. The financial report was given by the assistant treasurer, David Davis, and showed the membership of the congress to be 102.

The chief address of the morning of interest from the standpoint of forestry was that of E. T. Allen, of Portland, Oregon, forester for the Western Forestry and Conservation Association. After complimenting the lumbermen for their support of proposals for the better protection of the forest from fire, he referred to the good work accomplished by the fire associations and compared the records of the states where these associations existed with those where there was no such body. He discussed briefly the fire laws of the states of California, Oregon, Washington, Idaho and Montana.

Other papers given at the morning session were 'The Hill-climbing Locomotive', by E. O. Potter, of Portland, Oregon, and 'Topographical Surveys', by W. W. Peed, Samoa, Calif.

At Thursday afternoon's session Otto Lachmund, Manager of the Arrow Lakes Lumber Co., Arrowhead, B. C., gave a paper on 'Logging in the Interior of British Columbia'. He noted the difference between the logging methods used in the East and those in vogue in British Columbia, and also the dissimilarity of the methods in use in the coast district of British Columbia and those employed in the interior of the province; on the coast, for instance, donkey engines were used, while in the interior horses were found more economical. He discussed the shortage of labor and the danger from fire. Papers were also given at the afternoon session as follows:— 'Logging in Montana', by W. E. Wells, of Somers, Montana; 'Logging Redwood', by D. L. Albert ,of Oakland, Calif.; 'Logging Contracts', by A. J. Hendry, Vancouver, B. C.; 'Logging on the Sky-line', by C. E. MacFarlane, Portland, Oregon; 'Firwood Distillation', by W. E. Young, Portland, Oregon; 'Logging in U. S. National Forests', by H. M. Strathern, Port Falls, Idaho, and 'Cost of Wire Rope', by Jas. O'Hearne, Mt. Vernon, Wash.

On Friday morning the subjects discussed were 'The Adaptability of the Cable Locomotive on Steep Grades', by R. L. Fraser, Vancouver, B. C.; 'Electricity as applied to Logging and Logging Equipment', by A. E. Ransom, Seattle, Wash.; 'The Application of Electric Power to Logging Operations', by E. G. Robinson, Arlington, Wash.; 'A New Type of Donkey Engine Fire Box', by A. W. Clark, of Portland, Oregon; 'Gasoline Logging Engine', by R. J. Mullin, Seattle, Wash.; 'Lidgerwood Logging System', by R. D. Merrill, Seattle, Wash., and 'The Necessity for Uniform Scaling of Logs', by J. T. O'Gorman, Portland, Oregon.

On Friday afternoon J. A. Harvey, of Vancouver, read a paper on 'Employers' Liability Legislation' in British Columbia. He quoted the provisions of the legislation of the province in regard to workmen's compensation and criticized the clumsiness of the machinery for putting it into effect. He advocated raising an insurance fund to which the province, the employers and the workmen should contribute and which should be administered by a paid commissioner appointed by the province.

The employers' liability legislation of the Western States was also treated by Jas. B. Kerr, of Portland, Oregon.

The Resolutions Committee then submitted their report, which was adopted, and the election of officers was then held, which resulted in the re-election of the old officers.

On Friday evening a banquet was tendered the visitors by the British Columbia loggers, and on Saturday the delegates and their friends, to the number of about two hundred, visited the plant of the Canadian Western Lumber Company at Fraser Mills, at the mouth of the Pitt river. During the afternoon Prof. H. W. Sparks, of Pullman, Wash., gave a demonstration of his char-pitting method of clearing land of stumps.

Tacoma, Wash., was selected as the next place of meeting.

Log Scaling and Grading in British Columbia.

By Andrew Haslam, Vancouver, B.C., in Canada Lumberman.

The Doyle rule was used in British Columbia previous to 1902, and each mill had its own scaler, who scaled all the logs bought or logged for the mill. The Government appointed several scalers without salary, that could be called on in case of dispute. The system was not satisfactory, and gave rise to a great many disputes that were difficult of settlement.

In 1901 the Government appointed a committee to formulate a log scale that would correct the errors of the Doyle rule. The committee were Messrs. Alexander, King, and the writer. Mr. Alexander represented the mills, Mr. King the loggers, and the writer the Government interest. This committee ignored all previous rules and to arrive at an accurate result had a drawing made of the end of each size of log from twelve inches' diameter to 73 inches, including both. The drawing was made showing a slab three-fourths of an inch thick on each of the four sides. Inside of the slab a kerf three-eighths of an inch, then the log inside that was laid off in inch boards and three-eighths of an inch kerf alternately. Everything three inches and over in width was calculated in the contents, but under was not.

Logs that are not round are measured two ways, and the mean diameter on the small end is taken for calculating the contents of the log up to forty feet long. Over forty feet there is an increase in the diameter of one inch for each ten feet over forty feet.

The rule made on this base was legalized by an act of the legislature in 1902 and was named the "British Columbia Log Scale," and the use of it made compulsory west of the Cascade Range Mountains. East of this the Doyle was legal until July 1st, 1909. The British Columbia log scale is now legal all over the province.

The old method of allowing the mills to have their own scaler was legal until July 1st, 1906, when the Government appointed a supervisor and scalers to do the work west of the Cascade Range of mountains. In making these appointments the Government pays a regular monthly salary and charges five cents per thousand feet for all scaling, or, if called for, grading. The mill is supposed to pay all the scaling fees, but charges the logger one-half.

When scalers are required, there is an order sent to the supervisor's office, who sends out the first scaler reporting after receipt of the order. In this way neither the millman nor the logger knows who will be the scaler. Either party has a right to demand a rescale. The scaler who does the rescaling is not allowed to make up his boom; he simply sets down the length and diameter of the log and the volume is calculated in the office of the supervisor, so that there can be no collusion between scalers. If the rescale is within three per cent. of the original scale it is held to verify the original. If it is over three per cent., there is another scale by one of the scalers or by the acting supervisor. The supervisor's or assistant's scale is final and there is no appeal from it.

In August, 1906, the loggers and millmen met and agreed on rules for grading all logs, except cedar. The Government consented to the use of these rules, which gives them a permanency in so far as the Government's consent is concerned, but

there is nothing in the statutes to make them legal. The following is a copy of the rules:

Flooring—Logs suitable for flooring, reasonably straight; not less than 30 inches in diameter nor less than 20 feet long; clean; free from such defects as would impair the value for clear lumber.

Merchantable—Logs not less than 14 inches in diameter; sound; free from rotten knots or bunch knots; reasonably straight; the grain straight enough to insure strength.

Rough— Logs having visible defects, such as crooks, bad knots or other defects that would impair the value and lower the grade below merchantable.

Culls—Logs which will not produce 50 per cent. of their contents in salable lumber shall be classed as culls.

In all cases the scaler has the right to use his own judgment. There are defects characteristic of timber in certain localities for which it is impossible to make rigid rules.

On July 1st, 1909, the British Columbia log scale was legally extended over the whole province and the Government is now putting the necessary machinery in force to make its use compulsory over the whole province.

Take the scale as a whole, and the method of operation, I believe it is as free from defects or from influence of either parties interested as it can be at the present time. No doubt changed conditions may make changes necessary, but so far I believe there has been an honest effort to do what is fair between man and man. I believe the effort has been fairly successful.

LUMBER STATISTICS FOR 1910.

The compilation of the statistics for the year 1910 of the use of wood in the Dominion for lumber, pulpwood, etc., is now well advanced, and some of the bulletins are now in press. A summary of the results will be given in the next issue of the Journal.

CONSERVATION COMMISSION'S REPORT.

Since the last issue of the Canadian Forestry Journal the second annual report of the Commission of Conservation of Canada has been received. It is a cloth-bound volume of 230 pages.

The report falls into the following main divisions: (1) Proceedings of the Second Annual Meeting; (2) Resolutions adopted by the Canadian Forestry Convention; (3) Agricultural Work in Ontario, by C. C. James, C. M. G.; (4) Unsanitary Housing, by Dr. C. A. Hodgetts; (5) The Swedish Forest Conservation Law, by Dr. B. E. Fernow; (6) The Work of Conservation, (7) Conserving the Forests and (8) Mining in British Columbia, by John Hendry; (9) The Forestry Problems of British Columbia, by A. C. Flumerfelt; (10) Work of the Commision of Conservation in 1910; (11) Opinions given by the Commision in 1910, and (12) Proceedings of the Dominion Public Health Conference, Ottawa, October, 1910. Mr. Flumerfelt's paper is the same as that sent to the Dominion Forestry Convention at Quebec, but delayed, and now published in the appendix to the report of the Canadian Forestry Convention.

Of the above the chief items are those numbered (1) and (2). The actual proceeding of the Commission's annual meeting, of course, cover but one day, viz., January 17 (except for a committee meeting on the following morning), the members attending the Forestry Convention on the three following days. It is gratifying to members of the Association and others interested in forestry to know that the claims of forestry bulk so largely in the estimation of the members of the Commision. Items of the report relating particularly to forestry are Dr. Fernow's paper on the Swedish Forest Conservation Law, Mr. Flumerfelt's paper on The Forestry Problems of British Columbia, Mr. Hendry's article on Conserving the Forests and the summary of work done by, and the report of, the Committee on Forests.

An index covering some ten pages is provided.

REPORT OF QUEBEC CONVENTION.

The report of the convention held at Quebec, January 18 to 20, 1911, has been published and copies sent to all members of the Association. If any member has not yet received his copy, it is the result of accident, and the Secretary would be glad to know of such cases, so that he may forward another copy. Address Secretary, Canadian Forestry Association, Canadian Building, Ottawa.

Canadian Forestry Journal

VOL. VII. SEPT.-OCTOBER, 1911 No. 5

[Photo A. Mitchell.

Plantation (Manitoba Maple and Ash) in Central Saskatchewan, Showing Result of Four Season's Growth.

ANNUAL CONVENTION:

Ottawa, Feb. 7 & 8, 1912.

OTTAWA, CANADA.

FACULTY OF FORESTRY
UNIVERSITY OF TORONTO

Canadian Forestry Journal

THE CANADIAN FORESTRY ASSOCIATION

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
(2) The preservation of the forests for their influence on climate, soil and water supply.
(3) The promotion of judicious methods in dealing with forests and woodlands.
(4) Tree planting on the plains, and on streets and highways.
(5) Reforestation where advisable.
(6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership $10). Applications for membership or requests for information may be addressed to the

Secretary, Canadian Forestry Association,
Canadian Building, Ottawa, Canada.

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QUEBEC CONVENTION REPORT.

(French edition.)

Various causes have delayed the publication of the French report, but the printing of the volume is now well under way, and it is hoped that it will shortly be ready. The secretary will be pleased to receive requests for copies of the report, which will be filled as soon after receipt as possible.

CHANGES OF ADDRESS.

The secretary would be grateful if members of the Association would promptly notify him of any change in their addresses, so that the addresses on the mailing list of the Journal can be kept correct. Persons removing from one place to another should give both the old address and the new: this will greatly assist in the corrections.

To the Secretary, Canadian Forestry Association,
Canadian Building, Ottawa, Ont.;

I hereby suggest the names of the following persons as likely to become members of the Canadian Forestry Association:

Name. Address

... ...

Canadian Forestry Journal

VOL. VII. OTTAWA, SEPTEMBER OCTOBER, 1911 No. 5

THE official organ of the Canadian Forestry Association. A magazine devoted to the interests of forestry and in general to the advocacy of the wise and conservative use of the natural resources of Canada.

Annual Subscription, - $1.00
Single Copy, - - - 25c

Literary Contributions and communications regarding editorial matters should be sent to Mr. F. W. H. Jacombe, Canadian Building, Ottawa. Communications regarding subscriptions, change of address, and advertisements should be sent to the Secretary Canadian Forestry Association, Canadian Building, Ottawa, Canada.

The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

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THE 1912 ANNUAL MEETING.

At the meeting of the Directors of the Association, a full account of which will be found elsewhere in this issue, the date for the next regular annual meeting of the Association was fixed for

FEB. 7 AND 8, 1912.

This meeting of the Association promises to be one of special interest. Topics of immediate and vital importance to foresters, lumbermen and the public generally are on the roster for discussion. Besides many of the most prominent men connected with the movement in Canada, it is hoped that several well known authorities from the United States and even from England will be present and assist in the discussions. The convention will assuredly be worth making a great effort to attend.

The date for the meeting follows immediately on that of the Canadian Lumbermen's Association, and it is proposed to have a joint banquet of the two associations on the evening of Feb. 7.

Further particulars will be given in the next issue of the Journal.

Directors Meet.

Date of Annual Meeting Fixed for February 7 and 8, 1912, at Ottawa.

A meeting of the Directors of the Canadian Forestry Association was held on the afternoon of Oct. 20th at two o'clock in the office of the Director of Forestry, Ottawa. Mr. G. Y. Chown, of Kingston, president of the association, was in the chair, and there were also present Messrs. Wm. Little, H. M. Price, R. H. Campbell, Ellwood Wilson, J. W. Harkom, J. Lawler, secretary, and F. W. H. Jacombe, assistant secretary.

The chief business before the meeting was the setting of the date and place for the 1912 annual meeting of the association. It was decided that the annual meeting should be held at Ottawa on February 7 and 8 next. This is immediately subsequent to the meeting of the Canadian Lumbermen's Association, which convenes on Tuesday of the same week. Mr. Campbell was appointed as a representative of the Forestry Association on a joint committee of the two associations to make arrangements for a joint banquet on Wednesday evening and other matters to be arranged in common.

A committee of three, consisting of the President and Messrs. R. H. Campbell and Gordon C. Edwards, was appointed to arrange the programme of the annual meeting.

The following resolution of regret at the death of the late E. G. Joly de Lotbiniere and appreciation of his work for the association was passed:—

Moved by Mr. Herbert M. Price, seconded by Mr. R. H. Campbell, and resolved:

'That the Directors of the Canadian Forestry Association desire to place on record their sense of the great loss sustained, not only by this Association but also by the friends of forest conservation in Canada, by the death, at the comparatively early age of fifty-one years, of Mr. Edmond G. Joly de Lotbiniere. Like his father the late Sir Henri de Lotbiniere, one of the founders and first president of this Association, he always took the deepest personal interest in its work. For a number of years he was a Director and filled the office of President in 1906 on the occasion of the first National Convention in Ottawa. His efforts assisted in making that great meeting the success it was.

As a member of the Local Committee he worked hard and with great efficiency in arranging all the local details for the Quebec Convention of 1911, particularly in regard to the outing at Montmorency Falls. At all other times he gave unsparingly of time and thought for the advancement of the Association and the cause it represents, and on his seigniory of Lotbiniere, through a number of experiments, endeavoured to ascertain the most practical methods of protecting and developing the forests of Quebec. Besides this, the Directors desire to record their sense of the loss to his province and country of a citizen whose loyalty, integrity and consideration for the rights and feelings of others were always beyond question and who "ever bore without reproach the grand old name of Christian Gentleman".

To his family and relatives the Directors of the Canadian Forestry Association offer their heartfelt appreciation and sympathy.'

After the close of the meeting the president and a deputation of the

G. Y. Chown, Esq., B.A., President Canadian Forestry Association, 1911-1912.

directors waited on the new premier, Hon. R. L. Borden, in his office, in order to present to his consideration the work and objects of the association, and were given a cordial reception.

Changes in Constitution.

Notices of motion for any change in the constitution of the association should be in the secretary's hands not later than Dec. 31st.

Must Move Forward

Forestry in Canada has now arrived at that dangerous stage when all men speak well of it; as one leader recently remarked, 'If there was only some expressed opposition to forestry we could more readily make real progress'. Ten years ago Forest Conservation in its now generally accepted sense was practically unknown. Today everybody knows of it and has an idea, in a general way, that it is a good thing. But the difficulty is that now there is so much spoken, written and printed about conservation that far too many people believe that the work is progressing satisfactorily and that the volume of talk represents work done. In fact, public opinion is by the very frequency of the mention of conservation being lulled into false security. People believe that all governments, institutions and persons connected with forestry are alive to the dangers of deforestation, and have taken protective measures accordingly. As a matter of fact, as everyone knows who has looked beneath the surface, we in Canada are just about ready (or ought to be) to begin to do something.

People who read in the papers these days a great deal about Conservation imagine that all is well with Canada in this respect, and that, since the watchmen are awake, they can sleep comfortably in their beds. On the contrary, if they will take up the report of the Minister or any other official in charge of the public forests, they will see that instead of there being cause for complacency the situation is actually critical. From every one of these comes the same report, that at present he is concentrating what men and means he has on the problem of fire protection, but, in spite of this, fires are constantly destroying the best timber areas. Even where the officials have for years been able to keep out fire, the cutting of the best species of trees is giving opportunity for the growth of inferior trees, so that the whole character of the forests is undergoing a steady change for the worse, and the result will be that from a timber-producing standpoint they will in a few years have little or no value at all.

This is not intended to be an alarmist article, but simply to emphasize the point that, whereas the average good citizen believes that Canada is doing all that is required to protect and even increase her timber resources, the plain fact of the matter is that in this regard we are doing nothing at all. As stated before, the responsible authorities tell you they can only endeavor to protect what remains of the virgin forests from fire, and that for this they have very inadequate means. In regard to the re-stocking with valuable timber of lands unsuited for agriculture, however, there is practically nothing being done from Nova Scotia to British Columbia. There are millions of acres of lands belonging to the state which are fit for no other purpose than to grow trees. They bear no timber trees today and in fifty years, if present methods continue, they still will be lacking in merchantable timber. The great Miramichi fire took place in 1825; today after eighty-six years that once magnificent pinery has scarcely a timber tree on it, while pine has practically disappeared, not only from that district, but from the rest of New Brunswick and from large sections of Quebec. Now, if the other millions of acres of cut-over and burnt-over lands in Canada are not to be in the same useless condition at the end of another eighty-six years, then we must take warning and see

that some means are adopted for stocking them with the kind of timber trees best suited for the region.

Practical Forestry has now been conducted on professional and profit-producing lines for a long time in Europe; the statistics regarding forest production under rational management date back over a century. It is not suggested, however, that the time has come when in America, and (to bring the matter closer home) in Canada, we should put into force European methods. We shall probably never use these methods, certainly not in their entirety; conditions are different and so methods must necessarily be different.

On this continent forestry has been practiced long enough to give us the data to show what it costs and what profits it can be made to pay. There is no necessity for us in Canada to go to Europe in order to study forestry methods; much more useful would be found a tour of the United States National Forests, whose methods of management are being based to an ever increasing extent on the studies carried on by the Forest Service for years past, supplemented by whatever of European practice has been found serviceable under present American conditions.

Much more is already known of proper methods of managing Canadian forests than has ever been put into practice; what is needed is the chance to do what we know ought to be done. More money and more faith in the future are needed. The expense of organizing the immense forest areas of our country and of initiating the proper methods of management on them must necessarily be great. For years the forest reserves cannot reasonably be expected to return more than a fraction of the money spent on them. There can be no reasonable doubt that they will do so eventually, and the government can afford to wait that time as no private individual could.

This fact is clear from the experience of all times and of all continents that in forestry, just as in agriculture and in everything else, in order to get profits an investment must first be made. If cut-over and burnt-over areas are left to themselves they will not produce any profits from wood-crops or afford any protection to agriculture and stream-flow. If they are given a little protection they will produce a small crop of inferior wood; and if the matter be taken up in a rational way as a man would take up farming, profits will be obtained in proportion to the judgment exercised and the money expended.

It pays and pays well, to spend money on the forests. The countries which deal most generously with their forests have the handsomest returns. Saxony, as mentioned elsewhere in this issue, spends an average of $3.46 per acre on her forests every year, and gets, as return for this expenditure, a profit, over and above the expenditure, of $5.32 per acre. Wurtemberg, spending approximately $3.25 per acre per year on her forest land, makes a profit of approximately $8.00 per year. France, in return for an expenditure of $1.00 per acre on the forests, obtains, over and above this, a revenue of $1.72 per acre. When we come to forests less intensively managed, Austria, spending some 72 cents per acre per annum on her woodlands, makes therefrom a net profit of 28 cents. Sweden, spending one cent per acre on the forests, gets a profit of 6 cents, (part of it, probably, paid out of capital) while Russia, with the same expenditure, gets three cents per acre. India spends six cents per acre per year, and gets a return of four cents above her expenditure.

To mention reforestation brings up in the minds of many people the

vision of the forester as the man with a spade who goes out to plant one tree at a time. Now, as a matter of fact, at the present prices of lumber, labor and land, the denuded areas of North America are not going to be restocked by planting. Where trees of a desirable species have completely disappeared so that none are left for seed, there will have to be some planting, but to let things go until planting becomes a necessity will be to spell ruin, will be to bring in a state of affairs from which this country will not recover for a century or more. The forester is the man with the axe. The forester is, in fact, the lumberman working under improved conditions, and there is no time when these conditions can be improved so cheaply and with such good results as at the present.

To say all this is not to imply that the various Crown Lands and Forestry Departments of the Dominion are not alive to their duty, or that the lumbermen are all blameworthy, or that governments have not made, according to the state of knowledge, considerable provision for this service in the past. We believe that for years those directly responsible for the forests have been doing their duty as well as circumstances permitted. They have been more concerned, and are more concerned today, than anyone else in the country, but they have been, according to the old fable, expected 'to make soup out of stone'. The territories in their charge have produced a large part of the revenue which carried on the administration of affairs in this country, and we, the public, have not heeded their constant statement that if they were to be expected to provide a continuous revenue they must be given the means and the men to lay out a rational system by which the various forest areas would be restocked and allowed to grow without being burnt up.

As we have said, the public believe that forestry work in Canada is completed, that everything is in hand and that nothing more remains to be done, whereas in reality we have not yet started. It is therefore proposed to take up in the Canadian Forestry Journal from time to time specific cases of lands suited only for timber, to show their present state, what will happen if they are allowed to remain as at present or grow worse, and on the other hand what could reasonably be expected if they are properly handled, and to state as nearly as possible what will be the cost and what the profit, both direct and indirect, of rational treatment.

The Turtle Mountain Forest Reserve.

The Turtle Mountain Forest Reserve is one of the smallest of the Dominion forest reserves, but it is situated in very close proximity to a flourishing and prosperous farming community and to that section of Manitoba is of much importance.

The reserve consists of a tract of some 70,000 acres of land situated in Township 1, Ranges 19 20, 21 and 22 west of the principal meridian. It is thus in the very near vicinity of a number of flourishing towns, among which are Deloraine, Boissevain, Waskada, Ninga and Killarney. It is distant only about sixty miles in a direct line from the city of Brandon and forty miles from the town of Souris.

The land is from 300 to 500 feet

higher than the surrounding prairie. About 15,000 acres of it are occupied by lakes and 'sloughs', and so are under water, either permanently or for the larger part of the year. The soil is an impervious clay and the tops of the hills are sprinkled with boulders.

In the summer of 1904 a thorough forest survey of the reserve was made by a party under the direction of Mr. R. D. Craig, B. S. A., F. E., then Inspector of Forest Reserves, aad the report of the Department of the Interior for 1906 includes Mr. Craig's report on the reserve as a result of this survey.

Not Suited For Farming.

Why should not the land be occupied for farming? is a question that naturally strikes one. For several reasons the district is not naturally suited for agriculture. To begin with, the land lies at such an altitude that crops would always be subject to early and late frosts The soil is a very heavy, cold clay and could be worked only with difficulty. The drainage of the tract is very poor, as evidenced by the large number of lakes and sloughs, and the hilly topography makes it out of the question to use the land for any other agricultural purpose except for grazing. 'The soil in the reserve is mostly a clay loam with a few boulders', Mr. Craig says in his report on the reserve in 1905, 'but the configuration is so rough and so much of the area is in muskeg and sloughs that it is unsuitable for agriculture.....Attempts which I saw to produce grain were failures'. The conformation of the country results in the formation of many 'pockets', in which the frost would be almost sure to cut down crops except in favorable seasons. With hundreds of thousands of acres of desirable farming land of the highest fertility surrounding it, it seems little likely that anyone would desire such a tract for agriculture.

Possible Production.

Deducting the 15,000 acres of the reserve that are under water, there remain 55,000 acres of land suitable for growing trees. Up to the present the revenue derived from the timber and other resources of the reserve has been negligible.

From the data secured by the survey party from their strip surveys and tree and stump analyses, Mr. Craig found that the average annual growth per acre on the reserve might be conservatively estimated at one cord. Even if stocked only with the species of trees at present growing on it, cut on a forty-year rotation (that is, if the trees were allowed to grow to an average age of forty years) the reserve would produce a supply of 55,000 cords of wood per annum, or, in other words, the new wood formed every year on the entire reserve would be the equivalent of that quantity of timber. This could be obtained with little or no more expense than that of adequately protecting the reserve from fire and having the cutting properly regulated; and this result could be brought about through the expenditure of only a few thousand dollars annually. Thus, at the price of $1.00 per cord on the stump (surely a reasonable price in these days of scarcity of fuelwood) the reserve would produce an income of $55,000 per year. Of this amount, if but $15,000 per year were spent on its upkeep, there would still remain an unexpended balance accumulating at the rate of $40,000 per year. As a matter of fact, whether this amount be actually realized by the cutting and sale of the wood or no, the wood is still accumulating just as surely as bank interest and the value of the wood in the reserve is increasing by this amount.

The experience of European countries establishes the fact that the larger the amount spent on the cul-

tivation of the forest the greater is the return from it after all the expenses of management are paid. Saxony, for example, obtains from her forests an average return of some $8.78 per acre, gross, but of this amount an average of $3.46 (over three eighths of the total) is spent on the administration of the forest, leaving a net profit of $5.32.

The calculation of growth just quoted, moreover, is made on a very low basis. Poplar, useful as it is where no other timber is available, is a wood of comparatively little value. There are other trees of much higher value which can be used for stocking the reserve.

Many stumps remain even now on the reserve which show the size attained by the oak and elm which once grew there. Oaks up to a diameter of 22 inches were found and 16 to 18 inches in diameter was not an uncommon size for this species to attain. The management of these may, for the present, be of the simplest kind, as they sprout readily, and coppice management would be satisfactory. No expense would be entailed in this except that for protection and occasional thinning. It is estimated that the reserve, if properly stocked with oak, would yield some six million feet of timber of that species per year—a quantity not lightly to be passed over when it is remembered that all the oak used by the woodworkers of Manitoba (the agricultural implement and vehicle manufacturers of Manitoba alone used, in 1910, 1,835,000 feet of oak) had to be imported.

Administration of the Reserve.

The objects of administration must be several in number. First of all must come the protection of the reserve from fire. Then will come the regulation of the cutting of the remaining timber. An ideal arrangement would be the regulation of the cutting so that a fixed amount could be cut annually, the same for every year, and probably time will bring this about. For the present the aim must be to restrict over-cutting, to regulate cutting methods so as to minimize waste (e.g., avoiding the cutting of high stumps, making it compulsory to use the tops down to as small a diameter as practicable, the clearing up and destruction of debris, etc.) and, above all, protection from fire. After that will come the question of the re-stocking of the reserve, whether by natural regeneration, or by planting.

For many reasons a system of roads and trails throughout the reserve is a primary necessity. In order to get a force of men and supplies quickly to the place of a fire, roads are imperative. In order to open up the reserve, to make it possible for the timber in the central parts of the reserve to be cut and taken out and to render accessible to the public those parts of the tract that are fit for summer-resort uses, the roads are equally necessary.

The necessity of roads for adequate fire protection is emphasized by Mr. Henry S. Graves, Chief Forester of the United States, in his recent work, 'Principles of Handling Woodlands', and also in his Bulletin (No. 82 of the U. S. F. S.) entitled 'The Protection of the Forests from Fire'. He writes: 'An ordinary dirt road ranks as one of the best of all fire-lines. The wider the road is, the more effective it is. A forest well cut up with roads is, therefore, much more easily protected than one with few or no roads.' And again, speaking of trails, he writes: 'The first object of trails is to open up a forest and make it accessible for patrol and for fighting fires. In the National Forests this work of trail construction constitutes the first step in organizing for fire protection.....The trails in the National Forests are permanently constructed, and are designed for saddle and pack-horse travel. While their first purpose is to facilitate

patrol and access to a fire, they may be used as starting points for back firing, and will often check or actually stop a small surface fire.'

The construction of telephone lines from point to point within the reserve is a measure of great importance, primarily for the sake of fire protection and also for the great help it would afford in its general administration. In the bulletin already referred to Mr. Graves writes: 'One of the great difficulties in extensive forest districts is to secure the necessary help in fighting fires. The telephone is the greatest aid in fire patrol. It enables the man who discovers a fire to call for help and to give directions as to the number of men and the equipment needed. By the use of the telephone on the National Forests millions of dollars have doubtless been saved. The Forest Service has since 1906 built 4,850 miles of telephone line and it is extending the lines as rapidly as Congress furnishes the funds for the work.'

To make all parts of the Turtle Mountain reserve easily accessible by a system of roads would not be an expensive matter. About 30 miles of new road would suffice, and road-building within the reserve can be done at a cost of about $40 per mile.

The installation of a telephone line is not so expensive a matter in a forest as in a cleared country, where poles must be provided, transported and set up. It is estimated that the telephone line can be built for $40 per mile. Only about 30 miles would be necessary, making the cost for this item some $1,200.

Benefits of the Reserve.

At this moment the fuel question has reached an acute stage throughout the prairie provinces, owing to the labor difficulties in the Alberta coal mines. Consequently, the advantage of such a constant, dependable supply of fuel needs only to be mentioned to be conceded. It is not the first time in recent years—even within the past five years—that the same question has come to the fore. Is it worth nothing to the people of this district to have at hand at all times a plentiful supply of good fuel to mitigate the rigors of a western winter? The annual production of fuel wood on this reserve would give to every one of the 29,427 inhabitants of the electoral district of Souris (according to the returns of the census of 1906) nearly two cords of wood per year.

Out on the plains of Saskatchewan, in an entirely treeless land, timber has to be freighted hundreds of miles and the settler there can readily appreciate (as who, indeed, cannot?) the advantage of having a supply of timber practically at his door. Poplar is a poor timber, someone may object. With the growing scarcity of timber of all kinds, however, species formerly regarded as inferior are coming more and more into use, and many an Ontario man who, twenty years ago, would have nothing but the finest white pine, will today accept without question the erstwhile despised hemlock. Moreover, if poplar will not fulfil the requirements entirely, there are better kinds of timber that can be grown on the reserve.

The 55,000 cords of wood would, at the low ratio of 300 board feet of lumber per cord, amount to 16,500,000 feet of lumber per year. Now, the average annual cut of lumber per mill in Ontario in 1909 was somewhat less than 1,600,000 feet, so that the lumber thus produced would keep busy ten saw mills of the average size of those operating in Ontario during that year.

The question of the value of the reserve as a summer resort has also to be considered.

If Settled, What?

If, on the other hand, the tract is thrown open to settlement, what is

the likely consequence? The experience of older provinces and of foreign states and countries (e.g., Wisconsin) furnishes some idea of the probable result.

Ontario, the most advanced of the older provinces, can suggest an answer. Thirty years and more ago, through a mistaken policy, the district of Muskoka was thrown open for settlement. Many went into the district with fond hopes of establishing comfortable homes, making good livings and acquiring competencies, and, years afterwards, many of these persons would gladly have sold out for a song, had they been able, and left for more fertile fields. But who would buy?

Some of Ontario's older countries furnish additional examples. Years before the settling of Muskoka, settlers went on the sand lands in Norfolk and other counties in the southwest part of the province. For a time things went well. But ere long the humus of the soil was exhausted and its fertility disappeared, the crops were restricted to the rough grains like barley and buckwheat, and the farmer of a couple of hundred acres found that the results of his year's work gave him little more than the same number of dollars. He gained a bare subsistence and his farm grew worse and worse.

Not the least lamentable consequence is the moral deterioration that frequently comes to people so situated. Few in Ontario can have forgotten one revolting case that happened recently, in which the fact of people having settled on, and tried to make a living off, forest land has undoubtedly a bearing. And not all such cases come to trial.

In his report on 'The Reforestation of Waste Lands in Southern Ontario', Mr. E. J. Zavitz, speaking of this social aspect of the question, writes: — 'Many estimable and worthy families have mistakenly settled in these non-agricultural districts. The tendency, upon realizing the hopelessness of farming under such conditions, is to sell out or abandon the farm. Too frequently, however, it is impossible for them to sell the land and find means with which to better their conditions. This last state of affairs presents a sad problem. The most serious situation, however, is that in which the settler makes no struggle to improve his surroundings, but simply drifts, and gradually degenerates along with the land. It is not advisable to describe in these pages conditions such as actually exist in some parts of Ontario. A knowledge of the social conditions in these non-agricultural areas would itself be a convincing argument that such lands should be managed only for forest growth. These districts under attempted agricultural management cannot properly support social organizations, such as schools and churches. The state cannot afford to allow citizens to live and develop under the enforced conditions existing in many of these waste areas'.

Canada wants no 'poor white' element among its citizens.

FORESTRY IN SCOTLAND.

The secretary for Scotland in the British parliament has appointed a committee to consider and report on certain questions relative to forestry in Scotland. The terms of the reference to the committee are as follows: 'To report as to the selection of a suitable location for a demonstration area in Scotland; the uses, present and prospective, to which such area may be put (including the use that may be made of it by the various forestry teaching centres in Scotland); the staff and equipment required for successful working; the probable cost; and the most suitable form of management. To report as to any further steps following upon the acquisition of the said area which, in the opinion of the committee, it is desirable should be taken with a view to promoting sylviculture in Scotland, due regard being had to the interests of other rural districts.'

Hudson Bay Timber Survey.

Work of Dominion Forest Service Along Proposed Route of Hudson Bay Railway in 1911.

By F. W. Beard, B.S.F.

During the past summer a party under the writer's charge continued the timber survey of the Hudson Bay line from the point where Mr. Dickson's party discontinued its work in 1910. This was at the Manitou rapids, where the proposed railway line crosses the Nelson river.

The 1911 party went into this district by way of Lake Winnipeg on the SS. Wolverine, by which they were conveyed to Norway House (a Hudson Bay post situated at the north end of Lake Winnipeg). From here the journey was continued by way of the Nelson river, the party travelling in canoes. The proposed line of the railway was picked up where it crosses the Nelson river, at Manitou rapids.

The line of the railway, as projected, follows the Nelson river to Hudson Bay (a distance of 160 miles), so the party was able to keep parallel with the railway line by using the Nelson river and its tributaries as a means of transportation.

The Topography.

The absolute elevation of the country surrounding the Manitou rapids is 500 feet above sea-level. The surface of the total area covered varies from undulating to nearly level. The territory surrounding

A Typical Scene along the Nelson River.

Ascending a Rapid on the Kettle River.

the Manitou rapids is composed of areas of occasional granite rock outcrop, worn down to the general level of the country by the glaciers of the glacial period.

Further down the Nelson river towards Hudson Bay the country is practically level, with a slight northern exposure. The divides between river courses are very low, and it is not uncommon to find a muskeg situated on the divides.

There is a moderate slope down toward the Bay, and it occurs in east and west undulations, so that there is no drainage except by the Nelson river down to the Bay.

The Work of the Party.

The work of the party was of the nature of a reconnaissance survey, with the object of determining the nature of the forest cover, especially with regard to the suitability of the timber for railway ties.

The Forest Growth.

The type of the tree-growth is spruce-tamarack-poplar-pine. Black spruce predominates, associated with tamarack on semi-muskeg areas. Aspen and jack pine occur in mixture with the spruce on ridges and along water courses.

Black spruce is primarily a swamp tree, and is a common inhabitant of cold poorly-drained muskegs, so is a typical tree for this country. It occurs in pure, dense stands producing trees small in diameter and stunted in growth.

Jack pine and aspen occur on very limited areas and in small quantities throughout the territory. The type disappears entirely 100 miles from Hudson Bay.

Fire and its Work.

Fire is the greatest destructive agent in this country at the present time. Nearly the whole area covered, it was found, had been burned over within the last fifty years. The spruce forests are peculiarly exposed to the danger of fire in dry seasons. The trees are small in size and of coniferous species and grow in dense stands. This combination of qualities renders the forest especially subject to fire. A fire sweeping through a stand of black spruce, if it does not completely destroy the

trees, burns the moss away from the roots, thus leaving the trees unsupported, and kills the individual trees by scorching the foliage and injuring the cambium.

It is very difficult to protect this region at present, as it is so remote from any means of transportation, but the country is, and should be, protected, as far as it is economical to preserve the present stand for the protection of game and fur-bearing animals. The watershed of the Nelson river should be protected by keeping the forest-cover established.

Although the supply of ties is rather limited, the possible supply of cordwood, fence-posts and mining props is enormous. On account of its remoteness from settlement, however, it has little commercial value.

Forestry Branch Field Work, 1911

The work of the parties throughout the west has been considerably hampered in nearly every case by continued wet weather. Of the two parties under Mr. Edgecombe, the northern party reached Hay River about the middle of August and continued the work until they tied in at the junction of the fifteenth base line and the sixth meridian, when a number of the members had to leave the party to return to college. The southern party was also considerably delayed on account of rain and consequent floods in the rivers. Of the eastern boundary of the reserve from the eleventh base line to the Grand Trunk Pacific Railway line some forty or fifty miles were left uncompleted by the party, but it is expected that these will be covered before the end of the season.

Mr. D. R. Cameron, who is engaged in the timber survey around Lesser Slave Lake, also reports very bad weather. On the whole the results of the survey are rather disappointing, although it was feared that, as the result of fire, no great amount of mature timber would be found. The country has been explored to an average depth of twenty miles around the lake. For the most part, only small patches of large timber have been found, most of the country south of the lake being waste land with only scattered reproduction, and that mostly poplar. Some good timber, however, has been found. Some of the country is very difficult to travel in; along the north shore of the lake, which is covered with large boulders, men and horses must make their way as best they can over these.

The work of Mr. Van Dusen's party in the Porcupine Hills, Sask., has been considerably hampered by the wet weather. A considerable area, however, has been examined, which is bounded, roughly, by the Canadian Northern Railway on the north and east, the present northern boundary of the reserve on the south, and on the east by a line drawn north from the western boundary of Township 42, Range 28, west of the first meridian.

The party under Mr. E. G. McDougall has completed its examination of the Porcupine Hills, Alta., and has found a considerable area suitable for setting aside as a forest reserve. As a result of the work it is expected that a tract of some one hundred and ninety-six square miles adjoining the Rocky Mountain Forest Reserve is likely to be added to the Dominion forest reserves. Mr. McDougall is now engaged on an examination of lands proposed to be added to the Nisbet and Pines Reserves.

Mr. Curry on August 28th report-

ed having finished his examination of the country east of the Hudson Bay Company's post at Lac Seul, the Trout Lake watershed, and the Wenesaga River. His associate, Mr. Moodie, was then working Red Lake and Gull Lake watersheds, Mr. Curry being on the point of leaving for the Medicine Stone and Long Lake Rivers. A tract of country between the Wenesaga River and the Hudson Bay post at Lac Seul was still to be covered but would probably be finished about the end of October.

Mr. F. W. Beard concluded his survey of the timber along the proposed route of the Hudson Bay Ry., having traversed the Nelson river down to Hudson Bay and reached Ottawa about the middle of September. An article descriptive of his work will be found elsewhere in this issue.

Further work in the Rocky Mountain Forest Reserve was undertaken this summer in the direction of silvicultural studies on the Reserve, these investigations being entrusted to Mr. T. W. Dwight, a graduate of the University of Toronto in Forestry in 1910, who this spring finished a graduate course at the Yale Forest School. Instructions were given to Mr. Dwight to devote his whole time to the collection of silvicultural data in regard to the forests of the southern part of the reserve, especially those affecting the administration of the reserve. Special subjects of study were to be the old burns, old cuttings and the mature forests, and the factors influencing the reproduction and character of the forests. These were to be such as might determine the species of trees to be encouraged and how this should be done. He was then to visit the Deerlodge National Forest, which is included in District No. 1 of the U. S. National Forests and to study their methods of handling Engelmann spruce and lodgepole pine forests.

From July 1st to July 29th Mr. Dwight remained in the neighborhood of Coleman, Alta., chiefly in the valley of the Crowsnest River. Most of the time was occupied with studies of sample plots in various types of virgin forests in order to ascertain the relations of associated species and of volunteer growth, and the conditions of timbered areas. Strips were also run to determine the average amount of reproduction on certain areas. The first two weeks of August Mr. Dwight spent on the southern branch of the Sheep River near Okotoks and the latter half of the month near Banff, chiefly on the Spray River. A few days at the beginning of September were spent in the holdings of the Eau Claire Lumber Co., on the Ghost River. Attention was also given to the effects of clearing and damage caused to pine by the dwarf mistletoe and to spruce by the rust.

Mr. Dwight then proceeded to Missoula, Montana, and spent some time in the Deerlodge National Forest studying especially timber sale methods, the nursery, the creosoting plant, and reconnaissance methods, yield table work, marking and brush disposal.

The most of October has been taken up in the making of growth studies on the Maclaren Lumber Company's limits near Coleman.

BEECH FOR RAILWAY TIES.

A writer in a recent number of the German 'Forst und Jagd Zeitung' gives interesting particulars regarding the use of beech for railway ties. Beech ties are all, of course, treated with preservatives. Thus treated, they are said to be more durable than oak and to hold screws better. The wood must be perfectly sound and well seasoned. It is first treated with thirty to forty pounds of a weak solution of mercuric chloride, after which, by the recent methods of injection, some thirty-five pounds of tar oil (creosote) suffice to render it immune from disease. After injection a beech tie will weigh about 260 lbs., an oak tie about 220 lbs., and a pine tie about 150 lbs.

Le traitement préservatif des traverses de chemin de fer.

Notre provision de bois n'est pas ce qu'on la suppose généralement. Il se fait un grand gaspillage de bois dans nos manufactures et dans l'usage qu'on fait habituellement des traverses. A peu près un huitième des traverses sur les voies ferrées au Canada doivent être remplacées chaque année à cause de leur altération. Voici, la durée moyenne de la vie des traverses de nos bois importants, telle que rapportée par les compagnies de chemins de fer à vapeur: cèdre 9 ans; tamarac 8 ans; pruche 7 ans; sapin de Douglas 7 ans; pin gris 6 ans; épinette 6 ans.

C'est un fait connu et acquis par l'expérience des compagnies des voies ferrées de l'Europe et de plusieurs des Etats-Unis que si les traverses des essences ci-dessus mentionnées, ou même d'autres moins durables, étaient imprégnées de quelque préservatif, comme la créosote, le carbolineum, le chiste ou le chlorure de zinc, autant de matières qui retardent ou empêchent la détérioration du bois,on retirerait d'elles un bien plus long et satisfaisant service. A la dixième convention annuelle de l'Association d'Entretien des Voies, (American Association of Maintenance of Way) un comité rapporta que les traverses bien traitées à la créosote assurent un service de 15½ à 19 ans; traitées au chlorure de zinc de 10 à 14 ans; traitées au créosote au zinc de 12 à 18 ans. Encore, si les traverses étaient protégées contre l'abrasion mécanique, la durée de leur service serait prolongée d'autant.

L'introduction de quelque traitement antiseptique diminuerait grandement la demande annuelle qu'on fait à la forêt. Nous avons à part les cours des gares et les voies d'évitement, à peu près 28,300 milles de voies ferrées en opération et en construction au Canada, demandant 85,000,000 traverses. Dans les présentes conditions un huitième de ces traverses (10,625,000) demandent d'être renouvelées annuellement. Si le traitement préservatif était général, prolongeant la durée moyenne des traverses à 16 ans, le renouvellement annuel serait réduit de la moitié et il serait d'un seizième; par conséquent, une économie de 5,300,000 traverses chaque année. En supposant, maintenant, que nos limites forestières du Nord seraient parfaitement protégées contre le feu et traitées avec la meilleure prudence, ce que nous ne pouvons espérer, il faudrait de 2.000,000 à 5,000,000 acres pour produire 5,300,000 traverses de cèdre, de pin gris et de tamarac annuellement. Est-ce que cette seule raison n'est pas assez importante pour que le gouvernement, par des expérimentations, ou des démonstrations, encourage l'usage des traitements préservatifs du bois?

Est-ce que les compagnies elles-mêmes ne bénéficieraient pas de l'usage des traverses ainsi traitées? En supposant que la moyenne de la durée du service pour les traverses de n'importe quelle essence soit ce qu'il a été dit plus haut, (si nous ajoutons, aux prix moyens pour l'année 1909, 20 cents pour frais de transport et le travail de mettre ces traverses en place), nous verrons que le cèdre donnera 9 ans de service pour 65 cents, le tamarac 8 ans pour 59 cents, la pruche 7 ans pour 53 cents, le sapin de Douglas 7 ans pour 54 cents, le pin gris 6 ans pour 50 cents, l'épinette 6 ans pour 45 cents.

A un taux de 4 p. c. le coût annuel d'une traverse à l'état naturel des bois canadiens les plus importants, est, selon qu'elle représente l'épinette, 8.59 cents; le Douglas 9.00 cents; le pin gris 9.54 cents.

L'épinette et le cèdre sont des bois à fibres tendres, employés à faire des traverses, qui sont aisément détériorées par les vibrations et le poids des rails, que lorsqu'elles pourrissent elles se trouvent déjà-usées. Un traitement préservatif rendrait ces essences à même de résister aux causes détériorantes du temps pendant 15 ans et plus. Cependant, les traverses d'épinette et de cèdre, sous les lourds fardeaux qu'on leur inflige, ne dépasseraient pas la durée ordinaire de leur existence, à moins qu'on les aurait protégées contre l'usure mécanique par des pièces de métal.

Les autres essences canadiennes, le tamarac, la pruche, le sapin de Douglas et le pin gris peuvent mieux se passer de ces pièces de support. Mais il serait économique de leur faire subir un traitement préservatif. Quoique ces bois soient plus difficiles à traiter que les bois poreux, ils peuvent être imprégnés de créosote, et de plus être fournis d'une plaque de métal convenable, le tout au prix de 25 à 35 cents la traverse, ce qui leur assurerait un service de 15 ans et plus sur la voie ferrée.

Si nous allouions 30 cents pour imprégner une traverse de créosote et l'équiper d'une pièce métallique, de sorte qu'elle durerait 15 ans, le coût annuel par traverse sur la voie, à 4 p.c. d'intérêt, serait comme suit selon l'essence: l'épinette, 6.74 cents; le pin gris, 7.19; la pruche, 7.47 cents; le sapin de Douglas, 7.55 cents; le tamarac, 8 00 cents; et le cèdre, 8.54 cents. Ce serait une économie annuelle sur chaque traverse comme suit; de pin gris 2,35 cents; d'épinette 1.85 cents; de sapin de Douglas 1.45 cents; de pruche 1.36 cents; de tamarac 0.76 cents; et de cèdre 0.20 cents.

Ce traitement préservatif rapporterait une épargne annuelle dans le coût de l'entretien de chaque mille de voie ferrée, relative aux diverses essences de bois employé: de $70.50 sur le pin gris; de $55.50 sur l'épinette; de $43.50 sur le sapin de Douglas; de $40.80 sur la pruche; de $21.80 sur le tamarac et de $6.00 sur le cèdre.

Cette réduction des dépenses régulières dans l'entretien annuel des voies ferrées représente les gains obtenus, à 4 p. c. d'intérêt, sur $1,762.50 pour chaque mille de ligne où l'on emploi des traverses de pin gris; $1,387.50 pour l'épinette; $1,087.50 pour le sapin de Douglas; $1,020.00 pour la pruche; $545.00 pour le tamarac; $150 pour le cèdre.

Ces chiffres sont conservatifs. Il est tout à fait possible que les grandes compagnies de chemins de fer canadiens pourraient traiter leurs traverses et les pourvoir de cette plaque de support à moins de 30 cents pour chacune d'elles. De plus, il semble que parfaitement traitées elles dureront plus que 15 ans. M. W. F. Sherfesee, dans le bulletin n° 78 du Service forestier des Etats-Unis, estime que les traverses parfaitement créosotées dureront au moins 17 ans aux Etats-Unis, où, tout considéré, le climat est plus détériorant qu'au Canada. Les traverses de pin gris créosotées devant durer 16 ans coûteraient 6.86 cents par année; si elles duraient 17 ans, ce qui peut être raisonnablement espéré, le coût annuel ne serait que de 6.58 cents. Si l'on tient compte de la méthode actuelle dans laquelle on se sert de traverses non créosotées, on verra que si les traverses étaient traitées et pouvaient durer seize ans, on réaliserait une économie d'entretien de la voie de $79.50, et une économie de $88.80 si elles duraient dix-sept ans. A 4 p. c., le capital investi dans l'entretien des voies serait de $1,987.50, ou $2,220.80

de moins pour chaque mille qu'il est maintenant.

Pour faciliter toutes comparaisons nous résumons dans le tableau suivant une partie des chiffres que nous venons de voir:

Tous les taux sont à 4 pour cent d'intérêt. Nous avons ajouté 20 cents au prix d'achat pour transport et placement sur la ligne, et 30 cents pour traitement préservatif et plaque métallique. Bien traitées, les traverses doivent durer plus que quinze ans.

De telles incitations financières devraient pousser fortement les grandes corporations canadiennes des voies ferrées à entreprendre le traitement préservatif des traverses. Sans aucun doute, si le gouvernement se mettait de la partie pour coopérer avec les compagnies et démontrer qu'il existe, là, une réelle économie à tous les points de vue, l'adoption générale de cette politique serait hâtée de beaucoup.

Ce traitement préservatif encouragerait à se servir pour les traverses de chemins de fer du bois qui se perd maintenant; il donnerait de la valeur à du bois qui n'en a pas ou presque pas. Nous trouvons dans différentes régions du Canada des surfaces boisées, comparativement grandes, où le bois a été tué par le feu, et celui-ci reste debout. Ce bois est sec, léger et fort et on peut se le procurer à bon marché.

Il est fendillé et ne peut servir pour bois de construction. Il ne lui manquerait que la durabilité pour lui permettre de devenir propre aux traverses. Ce bois est si bien sec qu'un traitement préservatif est, règle générale, facile et efficace.

Maintenant, l'adoption d'un traitement antiseptique empêcherait la perte générale d'une très grande quantité de ces matériaux, et en ferait des traverses de première valeur. C'est la croyance unanime au Canada, qu'à moins que ce bois tué par le feu ne soit coupé dans un intervale de un, deux et trois ans, il est perdu comme bois de sciage. Cependant, aussi long temps qu'il restera sain, il pourra faire de bonnes traverses, si on lui donne le traitement préservatif qu'il requiert.

Dans l'ouest des Etats-Unis on a su utiliser, pour faire des traverses, de l'épinette d'Englemann et du pin de Murray (lodgepole pine) que le feu a fait mourir, il y a cinquante ans; imprégnées d'un préservatif, elles donnent de très satisfaisants services.

L'introduction de ce traitement chimique des traverses rendrait encore avantageux l'usage d'autres bois qui ne sont pas employés à cause de leur manque de durabilité; parfaitement assaisonnés, ils résisteraient à la détérioration aussi longtemps que les bois canadiens les plus durables. Ces essences qui sont, aujourd'hui, d'une si petite valeur, mais qui rendraient, avec un traitement chimique, des services adéquats comme traverses, sont: le peuplier, le liard, (cotonnier), le bouleau, l'érable rouge et le hêtre. Le peuplier et le bouleau particulièrement sont répandus avec une grande profusion par tout le Canada; ils croissent rapidement et bien. Ils croissent, surtout, et d'une manière très dense, sur les grandes surfaces de terrain qui ont été balayées par le feu, ou, après qu'on a enlevé le bois d'une forêt pour des fins commerciales. Ces essences, bien qu'elles soient très promptes à pousser et bien qu'elles soient des plus productives du Canada, ont un bien pauvre marché pour partage. Prouver que ces essences sont propres à faire des traverses serait résoudre le problème de leur trouver un marché et pourvoir aux besoins des chemins de fer, en substituant aux essences de valeur naturelle qui menacent de disparaître une immense provision de bois jusqu'ici inappréciée. Nous ferions d'une pierre deux coups, ce serait un double bénéfice.

Tout devrait être mis en jeu pour encourager l'usage de ces essences inférieures. Le cèdre, le tamarac, le sapin de Douglas sont des bois d'une telle valeur technique, qu'ils sont pour ainsi dire gaspillés quand ils sont employés à faire des traverses de chemins de fer. Le cèdre, le tamarac et le chêne deviennent rares au Canada, et, comme leur croissance est lente, les arbres qui partent ne se remplacent qu'après bien des années; l'usage de ces derniers bois, ainsi que celui du sapin de Douglas, devrait être restreint aux localités seules où on ne peut leur trouver aucun substitut.

Planting Trees.

By Peter McArthur, Ekfrid, Ontario.

[Mr. McArthur, from whose series of articles on country life in the Toronto Globe the following is clipped, is a well-known Canadian journalist and author. A little over two years ago he took up his residence at Ekfrid in Middlesex county, Ontario, and since then, in addition to his other literary work, he has written a good deal on rural life in that part of Canada. There are no suggestions to make in connection with the following except that he makes a mistake in thinking the trees he planted came from the farm of the Ontario Agricultural College at Guelph. Trees distributed by the Ontario Department of Agriculture to the farmers of Ontario came from Guelph for many years, but three years ago the nursery was moved to St. Williams, in Norfolk county, in regard to which an article appears in another part of this issue.—Ed. *C. F. J.*]

One thousand and eighty trees — all planted. The last two words of that sentence give me much satisfaction. There were times during the past week when I thought I would never be able to write them. When I started on this work of reforestation I had no idea how many trees there are in one thousand. Now I know, for I have planted one thousand and eighty. The Ontario Department of Agriculture agreed to send one thousand, and they gave good measure. Each bundle had one or two extra, which made an overrun of eighty. There were times when I did not feel duly thankful for this liberality, but now that they are all planted I feel differently about it. But before going farther I wish to thank Professor E. J. Zavitz for his consideration. After looking over the ground and finding that I was going to do the planting myself, he said quietly:—

'I shall send you a thousand trees.'

I had been figuring on getting two thousand five hundred, but now I am glad that I didn't. If I had got that number I would have deserted the country for the city, where the tree-planting is practised with more moderation and where the work is done by visiting princes and notables of that kind. Let it be understood, however, that planting a tree is not especially hard work. It is planting trees, a thousand of them, that makes a man feel like a horny-handed son of toil. The largest number I planted in one day, with a boy to help me, was three hundred. That was quite enough. I understand that the men employed by the Forestry Department plant about five hundred trees a day. If so, I am convinced that there is one branch of the civil service that really works. A man who plants five hundred trees in a day has no political snap. He earns his wages.

* * *

The trees came by express in a neat crate made from old lumber, which shows that they do things

economically in Guelph. Evidently no one has a fat contract to supply them with nice new lumber. They knock together a crate from any old boards that are lying around, just as any farmer would do it. That shows a praiseworthy spirit. I was particularly charmed when preparing to open the crate by finding a bent nail. That showed that they are not all scientists at Guelph. They evidently have some men there who cannot drive a nail into a pine board without bending it. That made me feel that I was dealing with men in my own class, and I was less afraid of the work before me than I would otherwise have been. Following the instructions I had received, I 'heled, healed or heeled in' the trees. 'Hele' is a good old English word, meaning to 'cover,' which I never before met with in print. You may spell it any way to like and it will still be right. As a dabbler in words, I am thankful to the foresters for reviving it. I also noticed that Professor Zavitz spoke about the 'boles' of the trees, and I was thankful for that. I had never before heard 'bole' used in conversation. But this is wandering from my theme. Only men who occasionally write verses know what a treasure a stranger word sometimes is in a language so barren of good rhymes as is the English.

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The whole trouble about the work of reforestration is the number of trees that must be planted. They use from twelve hundred trees upward on each acre. That means many days of persistent work to make any showing at all. And is the work worth while? Ever since announcing that I intended doing it I have had to bear the tolerant smiles of people who looked upon it as one of the whims of an impractical man. I am not going to rehearse the reasons for planting trees. They are many and sound, and have been placed before the public so often that everyone knows whether he is convinced or not. If trees are not planted, and what remains of the forest protected from pasturing cattle, this part of the country will soon be 'as bald as a campaign lie.' The present state of affairs is not so much due to the fact that the pioneers were rapacious as that they did not know how to take care of the woods. I remember hearing the older men talk about leaving part of the land under trees. They seemed to think that the right way to put a woodlot in order was to cut the underbrush and clear out the fallen timber. But I never heard one of them speak of the need of keeping out the cattle. When the woodlots began to die off they said it was because the forests around had been cleared away and that the trees could not live in the open country. If they had been told the right method to use in taking care of their trees I am convinced that many of them would have done their part properly. But now if we are to have trees we must plant. Though fencing in the woodlots has given good results in some cases, in many cases the new growth is largely made up of ironwood and blue-beech and similar 'weed trees.'

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It is quite true that I shall get no returns from this work of tree-planting as returns are counted. But what of that? Having done many days work from which I expected returns that I did not get, I do not mind doing five days' work from which I expect no returns. And yet it is hardly true that I shall get no returns. Already I feel a sort of glow of philanthropic satisfaction over my work. Someone in the distant future will profit by it, and will perhaps feel grateful. They say it takes three generations to make a gentleman, but it takes more than that to make a tree. Many generations of men will pass before the walnuts I have planted will be fit to use as timber.

(Concluded on page 138.)

Saxony's Forest Practice.

Its Results and Its Applicability to Conditions in America.

By H. L. Sullivan and E. F. Jennings in American Lumberman.

The state of Saxony is best fitted, geographically and climatically, for the growing of spruce. Hence spruce rules supreme. There is a splendid market for it within the woods, the creeks and rivers being utiliezd to the utmost for every inch of their fall to drive the wheels of saw-mills, pulp-mills and paper-mills. The

Typical German Saw Mill. Gage of Saws, 21. Feed of Carriage Two Feet a Minute.

Biltmore Students in 80-Year-Old Spruce Forest Being Clear-Cut in a State Forest of Saxony.

manufacture of pulp being the major industry, large trees are not necessary; hence a rotation or growing period of eighty years is strictly adhered to. The matured stands are cut clear and the clear-

Eighty Year Old Spruce in a Saxony State Forest. Smaller Second Growth in The Background.

ed areas are planted up immediately with about 3,000 seedlings per acre, at a cost of $8 to $10. Of these 3,000 seedlings, only about 130 will reach maturity, the rest having been removed from time to time by way of thinnings, thus furnishing additional revenue.

The prices obtained from the sale of the different wood products seem to us phenomenal. Fifteen dollars a cord is paid for pulpwood and from $25 to $35 a thousand for spruce sawlogs in the woods. The logs are all peeled immediately after cutting and the brush and debris scattered over the ground, enriching the soil by their decomposition.

It is interesting to note the measures that are taken to minimize the damage by wind. Spruce is a flat-rooted wind-weak species, and unless preventive measures are taken a large amount of windfall will occur, causing the local market to be overstocked. This difficulty is overcome by what is known as a cutting series, an arrangement of the stands and age classes in consecutive order. The forests have, as a consequence, the appearance of a flight of stairs.

Saxony is particularly famous for its efficiency in forest finance. Complete records have been kept of the forests since 1816, so that statistical material is available in Saxony better than anywhere else in Europe. The value of the forest has increased in the course of the last century at a compound rate of 3 per cent per annum, thus doubling every twenty-four years, while the woods were furnishing a surplus cash dividend of 2½ per cent on an annual average.

The famous Black Forest, situated in the highlands of Baden and Wurtemberg, presents an entirely different plan of management, though the species are practically the same as in Saxony. Spruce and fir predominate.

Owing to the absence of the pulp industry in this vicinity the trees are left to grow to a larger size, requiring a rotation varying from 100 to 120 years. Very little planting of seedlings is done, as reforestation is obtained by natural seed regeneration. This method of propagation, known as the shelterwood compartment type of regeneration, was originated by George Louis Hartig, and is in vogue in many parts of Germany. The idea is simple, and consists merely in removing a stand in three different cuttings, two partial and a final, within a regeneration period of twenty years. The first cutting is a preparatory cutting to obtain proper soil conditions, the second is a partial cutting to give more food to the oncoming seedlings; the third, or final, cutting takes place after the regeneration is well under way. The result is a close approach to the primeval forest. The average acre's yield at maturity is 25,000 feet, board measure, which sells at an average price of $20 a thousand.

In the show forest of Count Bergheim, at Weinheim, is a plantation of sequoia (California big tree) fifty years old. Judging from the wonderful results of this plantation, it is surprising that this species is not cultivated on a larger scale. An accompanying picture shows one of the trees in the plantation which calipers thirty inches at breast-height.

The questions naturally arise, To what can the success of German forestry be ascribed? and Are not the same principles applicable in America?

The answer to the first question lies in the following factors:—

First. Steady increase of stumpage prices.

Second. Limited amount put on the market.

Third. Protection from foreign competition.

Fourth. Dense population.

The steady increase of stumpage prices is the all-important factor; without it there can be no conservative forestry. Nowhere in the world does timber increase in mere volume at a rate exceeding two and a half per cent, and a rate as low as this does not offer enough inducement to warrant the raising of timber. There must be some additional source of revenue to make it profitable. This is furnished by the steady annual increase of stumpage prices which adds to the possible net surplus revenue of two and a half per cent, a latent dividend approximating in Germany three per cent. A high price of stumpage alone is not sufficient and does not involve a high rate of revenue. What is best is relatively, and not absolutely, best. The interest charges against the investment made in high-priced stumpage tend to counter balance, the surplus returns from high-priced stumpage.

Sequoia 50 Years Old Near Darmstadt, With White Fir, also Planted, in the Background.

The limited amount of lumber placed annually on the market is far from supplying the demand. The various state governments keep in touch with each season's demand and work together in controlling their output so as not to overstock the market. Imagine that John D. Rockefeller, J. P. Morgan, B. L. Duke and Elbert H. Gary would combine in America to cut a limited number of trees per annum!

Protection against foreign competition is effected by a tariff and by freight rates so high that the various wood products cannot be imported more cheaply than they can be grown at home.

ENGLISH FORESTRY ASSOCIATION.

The English Forestry Association has recently been formed, with the following officers: President, Lord Clinton; Honorary Secretary, Mr. Duchesne; Council, the Earl of Shaftesbury, the Earl of Chichester, Lord Hastings, Mr. G. L. Courthope, M.P., Mr. Chas. Bathurst, M.P., Colonel E. J. Mostyn, Mr. S. H. Cowper-Coles, Mr. F. G. Burroughes, Mr. Arthur Arnold, Mr. W. Anker Simmons, and Mr. Gerard H. Morgan. The objects of the association are to encourage the demand for English timber and generally to be of service to English producers of timber.

WILL USE CRUDE OIL AS FUEL.

The Canadian Pacific Railway has decided to use crude oil as fuel on their locomotives running through the timber country in the mountains of British Columbia. This announcement was given out by Sir Wm. Whyte, vice-president of the road, recently after a trip through the region. Two reasons are given for the decision: first, to reduce the danger of forest fires, and second, to make the work of the locomotive firemen less laborious.

1910 Forest Statistics of Canada—I.

Lumber, Square Timber, Lath, Shingles, Pulpwood.

The publication of the statistics of wood consumption in Canada for the year 1910 has been somewhat delayed owing to the press of work at the Printing Bureau resulting from recent events in the political world, but the bulletins containing these are now all in press, and will appear shortly. In addition to the statistics of foreign products so far published, a bulletin has been compiled on the use of wood by industries which use, as their raw material, wood already manufactured to some degree; this will appear as Bulletin No. 24, and treats of wood used in the manufacture of agricultural implements and vehicles, furniture and cars, and veneer. The names and numbers of the bulletins are as follows:

Bulletin No. 21—Poles Purchased.
Bulletin No. 22—Cross-ties Purchased.
Bulletin No. 23—Timber Used in Mining Operations.
Bulletin No. 24—(Wood Industries of Canada), Agricultural Implements and Vehicles, Furniture and Cars, and Veneer.
Bulletin No. 25—Lumber, Square Timber, Lath and Shingles.
Bulletin No. 26—Pulpwood.
Bulletin No. 27—Cooperage.

Lumber.

The number of sawmills from which reports have been received has increased by 32.6 per cent (2763 firms operating nearly 3,000 mills sending reports) and the lumber out-put by 28.5 per cent, or 1,086,707,000 board feet. The average cut per mill reported in 1908 was 1,774,000 board feet.

The consumption of lumber per capita in Canada was 653 board feet, which is 170 feet more than the per capita lumber production of the United States for 1909. Ontario still holds the first position among the provinces in lumber production; it still produces over one third of the quantity of lumber cut in Canada. The 1910 cut shows an increase of 7.5 per cent over that of 1909.

British Columbia is again second in lumber production, and its 1910 cut was only 45,000,000 feet less than that of Ontario. Quebec again comes third and the other provinces, in order of importance, are New Brunswick, Nova Scotia, Saskatchewan, Alberta, Manitoba and Prince Edward Island. There is a very large increase in the number of small mills which have reported from Quebec this year, and to this, no doubt, is due the fact that this province has the smallest annual cut per mill of any of the provinces, i.e., 71,400 feet. In British Columbia, at the other extreme, the average annual cut per mill is 7,297,000 feet—over 100 times that of Quebec.

The average price of lumber in Canada in 1910 was sixty cents per thousand less than in 1909, being higher only in Nova Scotia and Prince Edward Island. The average value in Ontario is nearly $3 per thousand greater than in any other province, owing largely, no doubt, to the large cut of white pine, which constitutes over 50 per cent of the province's cut. Spruce decreased in price $1 per thousand and Douglas fir $1.14 per thousand. Almost all other woods have increased in price. Birch shows the largest decrease, namely, $1.49 per thousand.

Spruce is the most important lumber wood in Canada, over one quarter of the total cut being of this species. The cut of white pine in 1910 was four per cent less than that of 1909, the decrease amounting to 42,163,000 feet. Several western species show remarkable increases. The increase in the cut of hemlock amounts to 51,000,000 feet and the increase in the case of Douglas fir to 47,000,000 feet. The cut of cedar has increased by 217,430,000 feet, or 114.8 per cent. Almost six times the quantity of yellow pine was cut in British Columbia in 1910 as in 1909; this increase makes it the sixth wood in quantity of cut for the year. The increase of 100,000,000 feet (140 per cent) in the larch cut in British Columbia brings that species to eighth place.

Softwoods comprise 94.3 per cent of Canada's lumber cut, the cut of hardwoods being only 5.7 per cent of the total. The total value of hardwood lumber produced in Canada in 1910 was $4,958,450 ($952,930 more than in 1909), and the value of the hardwoods imported into Canada, was more than fifty per cent greater than this.

The lumber production of the Dominion is also taken up by species used, twenty-six in number. The first six of these are spruce, white pine, Douglas fir, hemlock, cedar and yellow pine. New species reported this year are cherry, chestnut, tulip, sycamore and alder. Among the twenty-six species Ontario leads in the cut of seventeen, British Columbia in five, and Quebec in four.

Square Timber.

During 1910, 3,480 tons less of square

timber were exported than in 1909; the average price, however, increased by $2.03 per ton. The total value of the timber was $6,236 less than in 1909. White pine comprises 57 per cent of the total export of square timber, birch and elm having, respectively, second and third place. The foregoing three species make up 95 per cent of the exports. Over 97 per cent of the square timber exported goes to the United States.

Shingles.

The total number of shingles made in Canada during 1910 was 1,976,640,000, their total value being $3,557,211. This is really larger than the quantity manufactured last year, though, owing to an error, the total for last year was somewhat larger than it should have been.

British Columbia cuts, approximately, half of the total amount. Quebec takes second place, producing over one quarter of the total. These two provinces, as also Nova Scotia and Saskatchewan, increased their cut this year, while New Brunswick, Ontario, Alberta, and Manitoba cut considerably less than in 1909.

The average price of shingles was $1.80 per thousand, six cents less than in 1909 and twenty-seven cents less than in 1908. Cedar is by far the most important shingle wood, 93.5 per cent of Canada's shingles being made of this wood. Spruce, white pine, hemlock, balsam fir, Douglas fir, jack pine, tamarack and red pine are also used. The last-named two species are reported this year for the first time as shingle woods.

Cedar shingles cost on the average $1.79. Balsam fir shingles are the cheapest at $1.48, and tamarack most expensive at $2.49.

Lath.

851,953,000 lath were manufactured in Canada in 1910, the value being $1,943,544. The increase in the number of lath manufactured was $29,829,000 (3 per cent), but the value decreased $35,490. Of the total number, Ontario cut two fifths, increasing its cut over that of 1909 by almost 57,000,000—nearly 20 per cent. New Brunswick cut one quarter of the total, the increase in that province being 62,597,000. Quebec and British Columbia also considerably increased their production.

The average price for the whole Dominion in 1910 was $2.28. The average price in British Columbia was $1.66 and in Prince Edward Island $2.67.

Spruce and white pine lath comprise almost 70 per cent of the total. About one million and a half more cedar lath were cut this year, but Douglas fir, hemlock, balsam fir, and jack pine showed the greatest increases, ranging from 14,000,000 to 29,000,000 pieces each. The prices range from $1.25 for yellow pine to $3.18 for poplar.

The 4,901,649,000 feet of lumber were worth $77,503,187; the 37,962 tons of square timber exported were valued at $985,255; 1,976,640,000 shingles were worth $3,557,211 and the 851,953,000 lath $1,943,544. The total value of the products treated in Bulletin No. 25 was thus $83,989,197.

Pulpwood.

Fifty-one pulp mills sent in reports in 1910 and these used 598,487 cords of wood. In addition to this, 943,141 cords of pulpwood were exported in an unmanufactured state For the first time, imports of pulpwood were reported; these were valued at $49,322.

Over 95 per cent of the Canadian mills cut the pulpwood used by them from their own limits. The total value of the pulpwood used was $3,585,154, the average value being thus $6 per cord. From this pulpwood 474,604 tons of pulp were produced.

The total quantity of pulpwood used was 23,642 cords (3.8 per cent) less in 1910 than in 1909, but owing to a higher average price the value of the pulpwood was $121,074 greater than in 1909. There was in 1910 also a striking increase in the amount of pulp produced per cord of wood, the average amount being about 145 pounds greater per cord of wood than in 1909.

Quebec easily leads the other provinces in the consumption of pulpwood. It has practically half the mills in Canada (25 out of 51), and these consumed 57 per cent of the total amount of pulpwood used in Canada. Ontario, with 15 mills, consumed over one third of the total amount. Nova Scotia ranks third for 1910 in the consumption of pulpwood with 29,606 tons to its credit, and New Brunswick used 15,134 cords of wood, little more than one-sixth as much as in 1909.

In the province of Quebec the average price of pulpwood per cord fell to the extent of 35 cents per cord, but in all the other provinces, except British Columbia, the price increased, that increase amounting in the case of Ontario to $1.30 per cord; the 1910 price for pulpwood in Ontario was $7.02 per cord. The cheapest pulpwood in the Dominion was purchased in Nova Scotia at $3.00 per cord.

Spruce is still far in the lead as a pulping wood; it furnishes over three quarters of the total pulpwood consumption, or 78.6 per cent. Balsam fir is steadily increasing in importance as a pulpwood. In 1910 twenty per cent of the total con-

sumption was of this species. The quantities of poplar and hemlock were each about six tenths of one per cent of the total. Hemlock was reported as a pulping wood for the first time in 1909, and in 1910 was used to a greater extent than poplar. Jack pine has not been reported as a pulpwood for the last two years.

The cost of pulpwood varies very greatly, some big mill-owners having all their own limits and the cost to them being merely the carrying cost of their limit with transportation charges added. Other manufacturers have to buy in the open market, and add transportation charges to this price. Spruce was the most expensive species at $6.05 per cord, an increase of sixty-four cents over the 1909 price. Balsam fir fell fifty-five cents, the average price being $5.71 per cord. The price of hemlock was practically the same, and poplar increased eleven cents during the year.

The Quebec consumption was made up as follows:—Spruce, 70 per cent; balsam fir, 28 per cent; and the rest hemlock and poplar. Nova Scotia also cut these four species, but Ontario used only spruce, poplar and balsam fir, and New Brunswick and British Columbia used spruce only.

Almost four fifths of the pulpwood manufactured in Canada in 1910 was manufactured by the mechanical process, one fifth by the sulphite process and only 2 per cent by the soda process. Quebec leads in manufacturing mechanical pulp, but Ontario produces the greatest quantity of sulphite pulp. Quebec makes over three quarters of the pulp made by the soda process.

Spruce is used in all three processes, and leads in all. Balsam fir is used only in the mechanical and sulphite processes in nearly equal quantities. Eighty-four per cent of the hemlock was manufactured by the soda process and poplar by the sulphite and soda processes. Nova Scotia used only the mechanical process and a small quantity only of sulphite and soda pulp was produced in New Brunswick.

The average amount of pulp produced per cord of wood by the mechanical process during the year was 1,908 pounds, while the sulphite process gave 997 pounds of pulp per cord, and the soda process 987 pounds of pulp per cord. Seventy per cent of the wood used in the sulphite mills was spruce and 29 per cent balsam fir. Spruce, poplar and hemlock were used in the soda process.

The Ontario pulp mills have the highest average consumption, viz.:- nearly 14,037 cords per mill. The average consumption per mill in Quebec was 13,710 cords, in Nova Scotia 4,934 cords and in New Brunswick 3,783 cords. For the whole Dominion the average consumption per mill was 11,735 cords.

The export of pulpwood from Canada is steadily growing greater—an unfortunate fact, as the wood would yield greatly increased returns if manufactured in Canada. While pulpwood production was less in Canada during 1910 than in 1909, exports of wood-pulp increased by 48,233 tons, an increase of some 6 per cent. Eighty-eight per cent of the export was mechanical pulp, while only 78 per cent of the pulp manufactured in Canada was mechanical. The export of chemical pulp also shows an increase.

The average value per ton of the pulp exported in 1910 was $14.67 for mechanical pulp, and $36.35 for the chemical pulp. This is an increase of seventy cents over the 1909 price for mechanical pulp, but the price of chemical pulp has decreased $2.64. The average price for all wood-pulp exported was $17.31, or fourteen cents less per ton than the 1909 price.

Of the wood-pulp exported during 1910, three-quarters went to the United States, this country taking 74.3 per cent of the mechanical pulp and over 99 per cent of the chemical pulp exported. Exports to other countries decreased.

All the pulpwood exported in an unmanufactured state went to the United States.

About 4,000 cords more wood were cut for pulp in Canada in 1909 than in 1910. The total quantity of pulpwood cut in Canada was 1,541,628 cords, and of this over three-fifths was exported. The amount paid for this wood exported was $6,210,042. If this wood had been manufactured into pulp in Canada the amount received for it, at the average prices paid in 1910 by the United States importers of wood-pulp, would have been $13,528,481—over twice as much as was received for the pulpwood.

The pulpwood exported from Quebec, it is calculated, was sufficient to supply material for a year to fifty-six pulp mills of the average size of those operating in the province. Ontario's export would have kept running five mills of the average size of those operating in that province, while, had the 90,000 cords shipped from New Brunswick been manufactured in that province, twenty-four mills of the average size could have been kept running and five times the number of mills operating there would have been busy.

The average export of white pine square timber from Canada for the decade 1871-1880 was about fifteen times the quantity exported in 1909.

The above is a group picture of the forty-two students in attendance at the Woods Camp of Yale Forest School at Trinity, Texas, during the spring of 1911. This picture, which has been lent by the *Southern Lumberman* of Nashville, Tennessee, is of special interest to Canadians in that the tall student in the centre of the back row is Mr. T. W. Dwight, a graduate of the Faculty of Forestry of the University of Toronto, who took a year's graduate course at Yale. Mr. Dwight is now on the staff of the Dominion Forestry Branch, and during the past season has been located on the eastern slope of the Rocky Mountains where he is making a study of the conditions of reproduction in that region.

(Concluded from page 131.)

The pine, ash, cedar and butternut will also require their generations, and the world will see many changes before the work I have been doing is undone again by the axe of the lumberman. In looking at the work in this way, and in feeling that with these trees I am uniting myself with a future age, I am getting a return that is not to be entirely despised. Men do many things to make their work live, but I doubt if many do anything more certain to achieve that result than planting trees. A man may write a book that will 'walk the town awhile, numbering good wits,' but it will not be many years before it is as dead as the book about which Milton wrote that line. You may write a song, speak an oration, put a new law on the statute book, but they will all be forgotten before a tree that is planted to-day has reached its growth. As a matter of fact I am not afraid to enter my trees against any thousand and eighty books that will fall from the presses this year. It will be strange if the trees do not outlive them all. They will also probably outlast the fame of any thousand and eighty statesmen, financiers and much-admired public men. Before their term is fulfilled Canada may be the true seat of Empire, or our civilization may have gone down before the yellow races. It is vain to speculate what may happen before those trees arrive at maturity. Anything may happen. It is even possible that some future owner of the land where they are planted will clear them off or turn the cows to pasture among them. After all, their fate depends on others who are unborn. Still, I have done my share.

PRINCIPLES OF HANDLING WOODLANDS.

The Principles of Handling Woodlands, by Henry S Graves, Chief Forester, Forest Service, United States Department of Agriculture. New York, John Wiley and Sons; London, Chapman and Hall, Limited. Price $1.50, net.

In the literature of American forestry, the name of Prof. H. S. Graves has taken a prominent place. His "Forest Mensuration" stands at the head of its class and now he has again laid the forestry world under obligation by his venture into the field of silviculture in his later work.

The book is not, however, simply a treatise on silviculture. The topic of the regeneration, or renewal, of the forest is not taken up at any length, but rather treated incidentally.

The first chapter has a general discussion of silviculture, and in it the author defines forestry and silviculture, states the object of the latter, notes its cost, and gives some general considerations of silvicultural method. The four chapters that follow are devoted severally to the selection system, the clear-cutting systems (sub-divided into clear cutting with artificial reproduction and clear-cutting with natural reproduction), the shelterwood system and the coppice systems. A chapter on "Improvement of the Forests", treating of thinnings and cuttings, follows these.

The protection of the forests from fire has up till now loomed large in the handling of American forests, and the last third of the book is taken up with the discussion of this topic along the line of the same author's bulletin on "Protection of Forests From Fire", (U.S.F.S. Bulletin No. 82). The protection of the forests from other destructive agencies (insects, fungi, etc.) is also discussed.

The work is simple and untechnical in language and clear in style, and the owners of woodlands looking for knowledge as to their treatment will find no difficulty in understanding it. To the forestry student, hitherto confined in the study of the subject to more or less elaborate treatises on European methods, the book will be of great value as indicating the extent to which these will apply to conditions in North America. To the practicing forester it will be a convenient work of reference.

The book is illustrated with sixty-three half-tone cuts, mostly from Forest Service photographs, and is provided with a good index.

About 63 per cent. of the wood pulp produced in Canada is exported.

THE FORESTER'S LAMENT.

Anon.

I long for the land of the pinus palustris
Where the liriodendron is bursting to bloom,
Where taxodium distichum faithful, industr'ous,
Is waving in sadness o'er Clementine's tomb.

'Twas under the spreading hicoria pecan
We pledged our fond love by the light of the stars;
"If any be faithful," we whispered, "then we can,"
While leaning at eve o'er the fraxinus bars.

A fruit of the Psidium Guaiava (the guava)
She pressed in my hand as I bade her farewell;
But her love, hot as lava, grew cold as Ungava,
And my hopes, like the frost-bitten autumn leaves, fell.

They planted catalpa, the fair speciosa,
They planted the bush and the tree and the vine,
They planted a sprig of robinia viscosa,
And, underneath these, planted poor Clementine.

RAILWAYS AND FOREST FIRES.

At a meeting called by the State Forester of Wisconsin fifteen officers of the operating departments of the railways in the state, after discussing oil-burning locomotives and other remedies for preventing the setting of forest fires by railways, finally unanimously adopted the following resolutions:—

1. That the right of way be cleaned of all combustible material under the direction of the fire wardens.

2. That the burning of all debris on the right of way be controlled by the fire wardens.

3. That under special conditions there be a regular patrol properly equipped with fire fighting apparatus following each train.

4. That all freight train crews keep a lookout from the top of the caboose, and that they be required to stop and put out fires when discovered.

5. That some means be devised to keep a strip 100 feet wide adjacent to the right of way free from slashings.

6. That there be as much improvement as possible in the mechanical construction of locomotives.

WHAT DOES CONSERVATION MEAN.

'What does conservation mean? It means preservation, not waste; efficient development, not locking up these resources; the reasonable uses of them, having regard to the nation's interests; and last, but not least, the participation by the people in all the advantages and benefits of our natural resources.'

Hon. R. L. Borden, Premier of Canada.

ONE FARMER'S WOODLOT.

Forty years ago George L. Pillsbury, of Boscawen, New Hampshire, bought forty acres of land for $1,000 and set it aside as a wood lot. Even at that date he believed that timber could be made a profitable farm crop. The conditions were somewhat favorable to the success of the experiment, as Mr. Pillsbury was a builder and required native timber in his operations. During the forty years he has practiced conservative forestry he has converted the timber that decayed or developed serious defect into cord wood and the mature timber into building material, shingles, etc. Of exact figures none are at hand. It is known, however, that this forty yielded twenty cords of wood a year, aside from building material. Thus far in 1911 the lot has produced one car of spruce pulpwood which totalled eight and nine-tenths cords and brought $8 a cord f. o. b. station. In addition, 1,500 feet of hemlock sleepers were taken out this year and they brought from $16 to $20 a thousand. The wood output this year was thirty-five cords at $4.50 a cord, the 1911 production being a little heavier than usual. A few years ago Mr. Pillsbury sold seventy-five trees for $13 a thousand on the stump. They scaled 51,420 feet and brought him $668.46, more than two-thirds the price of the original forty.

The coniferous forest of Besancon, France, yields an income of about $16 per year per acre.

The forester of British East Africa estimates the Government timber area at 2,000,000 acres; this area is about equal to the woodlands of England. There are nine nurseries, with two branch nurseries. During the fiscal year 1910, ended March 31, 355,000 young trees were set outside, leaving in the nurseries more than 800,000 trees. An increased quantity of native timber is being used locally; nine sawmills employ some eighty Indian pit sawyers, who are engaged in this work. No exportation has yet been made.

FOREST DESTRUCTION IN ITALY.

The British Consul at Naples, reporting on the attitude of the Italians toward the forests, writes: 'There appears to be little popular regard for the value of forests in the national economy. One of the worst evils which this important asset of the country suffers from is that of fires, many of them undoubtedly wilful; during 1908 no less than 6,000 hectares (14,820 acres) of forest were destroyed by fires, of which at least a third were known to be due to incendiarism. The point is that the maintenance of the forest is to the general interest, whereas its destruction is to the individual interest of the proprietor, as he can then at least cultivate the land for some years and use it as a pasture later. An example is cited of state forest administration in the Abruzzo. During the years 1907 and 1908 no less than 19,000 hectares (46,930 acres) of forest were destroyed by fire; while in forty years, at the expense of millions, the government has succeeded in reafforesting only 27,000 hectares (66,690 acres). One of the remedies suggested is the exemption of forests from all taxation. At present the proprietors are prohibited from cutting down their woods, and yet have to pay taxes on them to government, province and commune.

THE LOSS OF A TREE.

A Chicago newspaper says that foresters are interested in a recent New York court decision affirming a claim for $500 as the "going value" of a tree cut down by a construction company. Nor was the award based on sentiment or granted merely as an exemplary matter. The tree alive had been a thing of growing value; cut down, the greater value to which it might in time have attained was forestalled. Consequently the measure of damage sustained in its present loss was not complete, but partial. It may be that to estimate its possible later value would entail a draft on the imagination as to definite amount, but the doctrine laid down by the court was sound.

The Worcester (Massachusetts) Woman's Club, one of the largest clubs in the general federation of woman's clubs in the country, with a membership of 600 and a waiting list, is one of the stanchest supporters of forest conservation in this state. There is a strong committee, which follows every state and national move in the interests of preserving the forests; and, wherever possible, legislators are approached by this committee to help along the good work.

Canadian Forestry Journal

VOL. VII. NOV.-DEC., 1911 No. 6.

A Good Stand of Timber on an Ontario Timber Limit.

ANNUAL CONVENTION, OTTAWA, FEB. 7 AND 8, 1912

A large and enthusiastic meeting is expected at the Capital on the above dates. The sessions of the meeting will be held in the Railway Committee room of the House of Commons. H. R. H. the Duke of Connaught has graciously extended his patronage to the convention. It is expected that the Premier and the leader of the Opposition will be present and give addresses. The railways have granted special rates for the meeting. For further information see page 141.

OTTAWA, CANADA.

HEREWITH is a picture of a volume of American Woods. Each volume shows the structure and color of twenty-five different woods by actual wood sections mounted in cardboard frames. These, with explanatory pages of text, fit into a neat book cover.

Price, cloth, ***$5.00.***
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Lantern slides of typical trees of United States and Canada, microscope and stereopticon mounts of woods, **50c. each.** Discount on orders of twenty-five slides and on sets, etc.

These goods enter Canada free of duty when imported for educational or scientific purposes. Canadian customers are referred to the Secretary of the Canadian Forestry Association at whose office specimens may be seen. Catalogue and specimen pages on request. Address the author.

ROMEYN B. HOUGH, :: Lowville, N. Y.

THE CANADIAN FORESTRY ASSOCIATION.

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
(2) The preservation of the forests for their influence on climate, soil and water supply.
(3) The promotion of judicious methods in dealing with forests and woodlands.
(4) Tree planting on the plains, and on streets and highways.
(5) Reforestation where advisable.
(6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership $10). Applications for membership or requests for information may be addressed to the

Secretary, Canadian Forestry Association,
Canadian Building, Ottawa, Canada.

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Canadian Forestry Journal

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Literary Contributions and communications regarding editorial matters should be sent to Mr. F. W. H. Jacombe, Canadian Building, Ottawa. Communications regarding subscriptions, changes of address, and advertisements should be sent to the Secretary Canadian Forestry Association, Canadian Building, Ottawa, Canada.

The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

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The 1912 Forestry Convention.

Ottawa, February 7 and 8, 1912.

Arrangements are now well under way for the Forestry Convention in Ottawa, Feb. 7 and 8, 1912. His Royal Highness, the Governor General, has graciously extended his patronage to the Convention, which will open in the Railway Committee Room of the Parliament Buildings at 10 a.m. of Feb. 7. The program is now in process of completion, and it is expected that among those who will attend will be: Hon. R. L. Borden, Prime Minister of Canada; Rt. Hon. Sir Wilfrid Laurier; Hon. Robert Rogers, Minister of the Interior; Hon. Martin Burrell,

La treizième convention annuelle de l'Association Forestière Canadienne, sera tenue les 7 et 8 février 1912, dans la salle du comité des chemins de fer, édifice du Parlement, à Ottawa. L'assemblée, qui est sous les auspices de S. A. R. le duc de Connaught, sera ouverte à 10 h. a.m., le mercredi 7 février. L'Hon. R.-L. Borden, premier ministre du Canada, y prendra la parole, ainsi que le Très-Honorable Sir Wilfrid Laurier; l'Hon. Robert Rogers, Ministre de l'Intérieur; l'Hon. Martin Burrell, Ministre de l'Agriculture; l'Hon. Gifford Pinchot, de

Minister of Agriculture; Mr. Gifford Pinchot, President of the National Conservation Association of the United States; Mr. Henry S. Graves, Chief of the United States Forest Service; Hon. W. R. Ross, Minister of Lands, British Columbia; Mr. R. H. Campbell, Director of Forestry, Ottawa; Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto, and Mr. E. A. Sterling, Forester of the Pennsylvania Railroad Company. Other acceptances are being received daily.

In regard to the program it is the endeavor to make it as practical as possible, and among the subjects to be discussed will be: the separation from politics of the various forest services of Canada by placing them under civil service regulations; the consideration of what constitutes a fair appropriation for the maintenance and development of forest reserves in Canada; federal versus provincial control of forest lands; and the most effective forms of legislation for the suppression of forest fires in organized and in unorganized territory and along railway lines. Discussion on the last named will arise upon the presentation of the Report of the Committee on Forest Fire Laws. This Report was prepared for submission to the Quebec Convention of 1911, but owing to lack of time it could not be reached. It was published in the appendix to the Annual Report of 1911, and members who desire to consult it in advance may turn it up in the Report. Should members have mislaid their copies of the Report or should any persons desire to have extra copies of the Report on Forest Fire Legislation it may be stated that a supply has been printed and that copies will be sent to any one applying.

The Banquet.

On Wednesday evening, Feb. 7th, there will be a banquet which will be participated in by the members of the Canadian Lumbermen's Association as well as the members of the Canadian Forestry Association and the friends of both. It has been decided to put this on a ticket basis so that all desirous of attending may have an opportunity of so doing. The price of the tickets will be three dollars ($3). Tickets may be obtained from the Secretary. It is requested that applications for tickets be made as early as possible so that full accommodation may be provided in advance.

Annual Business Meeting.

The annual business meeting of the Canadian Forestry Association for the passing of accounts, election of officers, transaction of business, etc., will be held in the Railway Committee Room on the afternoon of Thursday, Feb. 8th.

Notice is given of two motions, one to increase the number of Directors and another to place the decision as to place and date of holding annual meetings and conventions in the hands of the Directors.

Washington; M. H.-S. Graves, chef du service forestier des Etats-Unis; l'Hon. W.-R. Ross, ministre des terres de la Colombie Anglaise; et d'autres personnages éminents et experts en sylviculture.

Le mercredi soir, il y aura banquet. Le prix des billets sera de $3.00; on pourra s'en procurer en s'addressant au Secrétaire, qui les delivrera. Les personnes désireuses d'assister audit banquet devraient demander leurs billets aussitôt que possible, afin que l'on puisse aviser convenablement au côté matériel des préparatifs.

Une entente a été conclue avec les chemins de fer pour que les personnes qui viendront assister à la convention n'aient à payer qu'un seul passage qui leur donnerait droit à l'aller et au retour, et ce du 3 au 8 février inclusivement pour l'arrivée, et jusqu'au 12 février inclusivement pour le retour.

Les délégués devront donc acheter un billet de première classe, simple, pour Ottawa, et se faire délivrer un reçu sur la formule de certificat établie pour de telles circonstances, ce qui pourra être obtenu de l'un quelconque des agents de chemins de fer. Ces certificats seront signés, par la suite, par le secrétaire de l'association, à Ottawa, ce qui donnera droit à tout délégué d'obtenir, gratis, un billet de retour: sur simple présentation dudit certificat, et remise de 25 cents au représentant du chemin de fer auquel il s'adressera. Pour plus amples informations, et pour avoir un programme détaillé, prière de s'adresser à

JAMES LAWLER, Secrétaire.

Association Forestière Canadienne, Canadian Building, Ottawa.

Railway Arrangements.

Arrangements have been made with the railways which enable the Association to promise a rate of a single fare for the round trip to all attending the Convention from all points in Canada east of Port Arthur. This rate is, of course, open to ladies attending the Convention.

In order to participate in this reduced fare, delegates must purchase first class one-way tickets to Ottawa, and secure certificates to that effect on the Standard Certificate form from the railway agent selling the ticket. Railway ticket agents are supplied with these certificates and are instructed to issue them on application.

These certificates will be presented to the Secretary at the meeting, and after being signed by him will entitle the delegate to a free return ticket upon the presentation of the certificate with a fee of twenty-five cents to the railway representative who will be in attendance. Tickets will be good going Feb. 3rd to 8th inclusive, and returning until Monday, Feb. 12th.

(See page 168, second column.)

Reforestation in Manitoba.

What will be easily the largest reforestation project in the Dominion of Canada, and, indeed, one of the largest on this continent, is being entered upon by the Forestry Branch of the Department of the Interior, the area to be reforested being the Spruce Woods Forest Reserve, in Manitoba.

The Spruce Woods Forest Reserve.

The Spruce Woods Forest Reserve, as determined by the *Dominion Forest Reserves and Parks Act, 1911,* comprises a total area of some two hundred and twenty five square miles (144,000 acres) of light, sandy land lying to the south of the main line of the Canadian Pacific Railway from about the middle of Range 12 to the western boundary of Range 16, west of the principal meridian, or, approximately, from Panser to Hooten sidings on the railway.

The western boundary of the reserve thus approaches within fourteen miles of the city of Brandon, while the extreme easterly boundary is located some eighty miles west of Winnipeg.

It is traversed also at the extreme northwest by the Canadian Northern Railway line from Brandon to Portage la Prairie, the station at Onah being within the reserve. The reserve is protected along the line of the railway by plowed fireguards.

The soil is light and sandy and unfit for farming. The only branch of agriculture which can be carried on with any degree of success at all is grazing. Many attempts have been made in past years to farm it and homestead after homestead has been taken up only to be abandoned.

Included in the reserve is quite a large area of swampy land in which a good growth of tamarack is found.

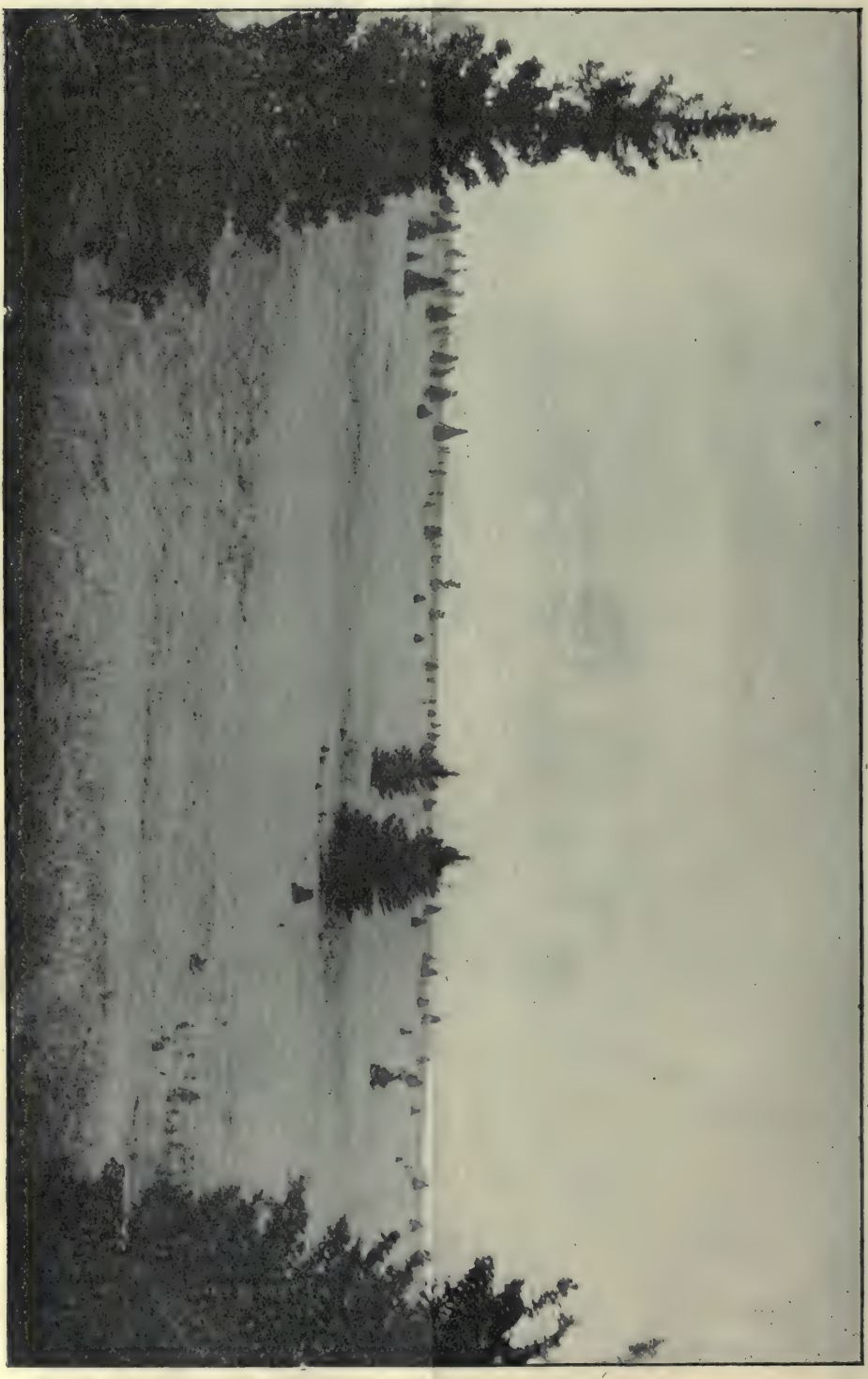
The problem of the reserve is essentially one of reforestation. The sand hills bear a sparse growth of white spruce of good size, the existence of which is proof positive of the suitability of the region for the growth of a coniferous forest. In 1904 and succeeding years, up to 1908, a large number of two-year-old Scotch pine were planted. Owing to unfavorable weather at the time of planting, the first planting of some ten thousand trees was only partly successful, and in the spring of 1907 it was burned over. Small sowings of Scotch pine, jack pine and lodgepole pine were made at the same time, but the sowing has not met with very good success. A total of about twenty five acres has been planted with the two-year-old stock. Further and more extensive planting was done in 1905, 1906 and 1908, the total number of trees planted being about seventy thousand. The soil in which the trees were planted was almost pure sand.

Mr. Kirkwood, who has been put in charge of the nursery work in the reserve, reported under date of September 9th last, that this plantation is doing well and is of the opinion that this species will succeed.

The average cost of the planting has been about $5 per acre. The two-year seedlings used cost considerably less than $1 per thousand, dug and ready for planting.

Scotch pine was used, not because it was considered especially suitable for planting, but for the sole reason that it was most convenient to obtain the seed and raise the plants. White spruce is native on the reserve. Seed can now easily be obtained and the plants seem to be very hardy and suitable for planting.

With the idea of entering upon extensive reforestation work on the reserve the Forestry Branch has established forest nurseries at Onah



Typical View of Territory to be Reforested in Spruce Woods Forest Reserve.

and Shilo, on the Canadian Northern Railway. These nurseries have been put in charge of Mr. J. D. Kirkwood, who is a native of Scotland and had seven years' experience in forestry work in Scotland, England and Ireland. He has had charge of the nurseries for some months, after having spent some time at the Indian Head nurseries of the Forestry Branch in order to familiarize himself with conditions in the prairie provinces.

In the planting operations white spruce and jack pine will be used for the most part, and bull pine, lodgepole pine, black spruce, Norway spruce and Douglas fir will also be experimented with.

A detailed plan of planting is being arranged and further announcement will shortly be made.

It is somewhat hard to predict just what the rate of growth on this reserve is likely to be, as no systematic measurement of the growth has been made. On the sandy soil of the Pines Forest Reserve near Prince Albert, Sask., white spruce, under unfavorable conditions of soil, moisture supply, etc., attains a diameter of 10.2 inches in seventy years and it is entirely safe to assume a growth of that amount for spruce on the Spruce Woods Reserve where conditions for the growth of spruce are favorable as shown by the fact that spruce is practically the only tree that grows on the reserve.

The risk of fire may be minimized (in fact, practically eliminated) almost without expense if the arrangement of the planted area is studied at the beginning, roads provided, etc.

A spruce tree ten inches in diameter can be depended upon to give fifty feet, board measure, of lumber. Calculated at two hundred trees per acre—a low rate—there will thus be in seventy years at a very conservative estimate ten thousand feet of timber per acre on the reserve. Even now, the timber will sell at $6 on the stump, so that at the end of seventy years the value of timber per acre on the stump will be $60, a total for the reserve of $8,640,000.

Since the above was written it has come to the knowledge of the JOURNAL that efforts are being made by the Militia Department to obtain the western part of the reserve as a camping ground. This is the larger part of the reserve and that which, since the institution of the reserve in 1895, has been held by the Department of the Interior as a forest reserve. It is that, too, in which experiments up to the present have been made. Needless to say, the institution of a camping ground on the territory would bar all further attempts at growing trees thereon. It must be the hope of everyone who has at heart the welfare of forests in Canada that the efforts of the Militia Department may not be successful.

Senator Smith, of Maryland, a lumberman of many years' experience, and a member of the National Forest Reservation Commission, has introduced in Congress a bill providing for the appropriation of $500,000 annually to acquire lands along the Potomac river adjacent to Washington, for a national park and forestry purposes. The provisions of the bill in regard to the acquirement of the land and other legal phases are similar to those of the Weeks' bill. Five per cent. of the receipts from timber sales are to be paid to the States in which the forest may be located.

Press reports indicate that serious insect devastations are occurring in the spruce forests of Maine, the damage being caused by the sawfly, which destroyed most of the tamarack in Maine in the early 80's. It is reported that the present outbreak is confined to spruce, and for this reason it was not believed that the insect could be the sawfly. The State Department of Agriculture, however, has identified the insect as the sawfly, claiming that the damage is due to slits made in the smaller twigs by the female insect in preparing a place to deposit her eggs.

Ontario Should Reforest.

[The article which follows comprises a number of excerpts from 'Ontario's True National Policy in Regard to Black and White Coal', a pamphlet by Mr. W. K. McNaught, M.P.P., now a member of the Ontario Hydro-electric Commission. In regard to his views on reforestation, as well as his emphasizing of the importance of Ontario's water-powers which depend so largely on her forests for their equalization and maintenance, the pamphlet is of much interest to foresters.—*Ed.*]

It has been often asserted by the opponents of the Ontario Government's hydro-electric power policy that, while it might perhaps be all right for the manufacturer, it would be of little or no value to the ordinary citizen.

* * *

I need not do more than point out that, although the manufacturer may primarily be the greatest gainer by this enterprise, it will also beneficially affect every citizen residing in any of the districts where cheap hydro-electric energy is supplied.

* * *

The Coal Situation in Ontario.

The Province of Ontario is unfortunate in respect of its fuel supply. Although it has an almost illimitable supply of pulpwood and other valuable timber, it is entirely without any coal of its own. True, Canada has magnificent coal beds in the Maritime Provinces, as also in the Western Provinces, but these are of little or no value to the Province of Ontario, inasmuch as the charges for transportation would practically put it beyond the reach of our citizens, except as a makeshift during a fuel famine. Practically every pound of coal used in this province comes from the Pennsylvania coal mines, and, unfortunately, the corporations that own the coal also own the railways over which it has to be transported. With this double-headed monopoly it is self-evident that the citizens of both the United States and Canada have to pay all that the traffic will bear.

The Future Looks Dark.

But bad as is the presnt condition of affairs in regard to the coal situation, it might be, and indeed it will surely be, very much worse, unless we become alive to the situation and conserve our natural fuel resources.

As I have already pointed out, although we have an almost inexhaustible supply of pulpwood and other valuable commercial timber, our supply of hard wood has been wasted to such an extent that it cannot be counted on in the older settled portions of the Province except as a *'dernier ressort'* during a period of fuel shortage, so that, after all is said, the citizens of Ontario are really dependent for their fuel upon a foreign country, and the supply of this vital necessity may be cut off at any time from any one of a number of causes.

The U. S. Need All Their Coal.

That the people of the United States are becoming thoroughly alive to the coal situation, is evidenced from their appointment of a Conservation Commission, which is now making exhaustive enquiry into the natural resources of the United States and how they can best be dealt with for the benefit of their own people.

But, says some one, if even what you say were true, there is little danger of an exhaustion of the coal supply of the United States for thousands of years to come.

In this, however, I am afraid that

the wish is father to the thought. Some years ago (May, 1908) a meeting of State Governors and other distinguished and scientific men was called at Washington by President Roosevelt to discuss the conservation of the national resources. Amongst others who attended this meeting was Andrew Carnegie, and in his address he made the statement that the United States was even then within measureable distance of the exhaustion of their supply of anthracite coal, and he placed the life of the Pennsylvania coal fields at less than fifty years, even at the then present rate of consumption. This statement has since been confirmed by scientific authorities.

Preservation is the first law of nature, and it is therefore probable that long before the coal in the United States becomes exhausted, the entire supply will be taken over by their Government and conserved in every possible way for the national benefit. One thing is certain, not a single pound of it will be allowed to be exported from the United States.

What Can Ontario Do?

This being the case, what remedy will the people of Ontario have? So as far as I can see, their remedy can lie only in three directions:

First, the application of scientific methods to our great virgin forests and the reforestation of cleared lands which are unsuited for agriculture. The application of scientific methods to our existing forests could be quickly brought about, but, unfortunately, only a small proportion of our standing timber is suitable for high-class fuel, and could never take the place of coal, either for heating purposes or for the production of power. In addition to this, the supply is situated far from our present commercial centres, and, even were it suitable, the freight would enhance the price so much as to make its use almost prohibitive.

The reforestation of old Ontario, especially with hardwoods suitable for fuel, would be a very slow and expensive process, but it could be done with profit to the community generally, and the sooner such a policy is entered upon by the Government, the better it will be for the future of the province and for those who will come after us. For not only will such forests produce valuable commercial timber as well as fuel, but they would materially help our farmers by increasing the rainfall, diminish the danger from spring floods, and increase and equalize the flow of our rivers so as to render them more valuable for the development of hydro-electric energy.

Second, the exploitation of the immense beds of peat fuel to be found within the boundaries of the province.

Third, the nationalization and development of our water powers. This has already been taken hold of by the government of Ontario, under the management of the Hydro-electric Commission, and they are at present endeavoring to supply the people of Ontario with power as near its actual cost as is commercially possible. This is not only a new but a true national policy, which will ultimately be of advantage to every man, woman and child in the province of Ontario.

[Mr. McNaught here gives a detailed estimate of Ontario's water-powers, which total as follows: Niagara River, 3,000,000 h.p.; Central Ontario, 2,201,187 h.p.; Northern Ontario, 2,030,600 h.p.; total, 7,231,787 h.p. In order to be on absolutely safe ground he assumes that they would have a minimum development of 3,000,000 h.p.]

Value of Ontario's Water-powers.

On the assumption, therefore, that we can always depend upon our water powers for a development of 3,000,000 h.p., what does this really mean to the people of this province?

[Courtesy "Sunshine," Montreal.

In the Woods: Loading the Sleigh.

Translated into coal and taking 20 tons of coal as the amount necessary to produce one horse-power of energy for 24 hours per day for one year (a very low estimate), it would mean that our water-powers are as valuable to Ontario as coal mines capable of producing 60,000,000 tons of coal per year.

Translated into dollars and cents, it means that, taking coal at $3.00 per ton, we would have an annual development of power from our waterfalls which, if produced from [illegible] would cost us $180,000,000 in the Western Pro[illegible] are of little or no value [illegible] ince of Ontario, inasmuch also, that charges for transportation [illegible] for one practically put it beyond the rea[illegible] of our citizens, except as a make-shift during a fuel famine. Practically every pound of coal used in this province comes from the Pennsylvania coal mines, and, unfortunately, the corporations that own the

[illegible]

is quite true, and this difference has been placed by Professor Fessenden at an average of $20 per horse-power per year, which would amount to $60,000,000 per annum, if estimated on the 3,000,000 h.p. which our water-powers are capable of producing.

These figures are so large as to make it difficult to realize just what they mean, but perhaps their importance can be better understood if the actual value that could be realized from the proper utilization of our provincial water powers is compared with the output of the farms of this province. The official report of the Department of Agriculture for the province of Ontario gives the market value of the crops for the year 1908, consisting of fall wheat, spring wheat, barley, oats, peas, beans, rye, buckwheat, corn for husking, potatoes, carrots, mangel-wurtzel, turnips, sugar beets, mixed grain, corn, hay and clover, as having a total value of $164,077,282, which is considerably less than the actual cash

value which could be obtained from our water-power devlopment were it utilized to its full capacity. We boast of the wonderful wheat crop of our great and ever-expanding West, but in our provincial waterfalls we have a Golconda capable of producing each and every year, for all time, an amount of power worth nearly double the present annual value of our western wheat crop, enormous as that now appears to us.

Present Saving to the Province.

The figures given above are, as already stated, based upon the full development of our water powers, and the objection may be raised that at the present time but very few of them are developed, and that therefore the estimate of the amount of power which may be obtained from them is merely theoretical and of little practical value.

* * *

As I have already pointed out, the greater part of the power at present used in this province is generated from steam, produced from coal imported from the United States at an annual cost of over $16,000,000 in good Canadian money.

Even if the utilization of all of our water-powers could not produce more electric power than would offset this $16,000,000 now paid for steam coal, would it not be a wise as well as a patriotic policy to try to keep this vast amount of money in Canada, where it would be used for the purpose of paying our own artizans and engineers in order to utilize water powers which would otherwise go to waste, instead of sending it to swell the pay roll of United States coal miners or fill the coffers of the coal barons of that country?

As I have already pointed out, the potentialities of our provincial water-powers are so great as to eventually effect a saving ten times larger than our present coal consumption, large as that may look to us just now.

In my opinion, the day is not far distant when hydro-electric energy will be generally used throughout this province for every purpose for which power is required. Even our present steam railways will be transformed into electric roads, and thus become the largest customers for hydro-electric power instead of being the largest consumers of imported coal, as they are at present.

Power Must Be Publicly Owned.

The effect upon the province of Ontario when the government's policy of cheap hydro-electric power becomes fully realized, must be very beneficial to the great mass of our citizens. Not only will they have cheaper light for domestic and public use, cheaper water, cheaper street car service, purer and healthier air in their dwelling places and workshops, but we will have cheaper power for our manufacturers, which will mean more work and higher wages for our artizans.

The future of Ontario as a manufacturing province is largely bound up with the power question. If we are to maintain our present position as the manufacturing centre of the Dominion, let alone improve our lead on the other provinces in this respect, we must not only utilize our splendid water-powers to their utmost capacity, but we must also take full advantage of the Government's policy of publicly-owned power, power owned by the people and distributed amongst them at as near its actual cost as possible.

The importance and value of our great water-powers is strikingly emphasized by the efforts that promoters and monopolists are making to secure them before the people become alive to their real value and importance.

On every hand, from the St. Lawrence to the extreme west of Ontario, we find groups of capitalists endeavoring to get their grip upon

[Courtesy "Sunshine," Montreal.

In the Woods: Starting for the Dump.

our water powers, the same as they have already secured upon those of the Niagara River. If this is once permitted, it will mean that, so far as price is concerned, the monopolists will charge all that the traffic will bear, and the people will for all time have to pay just as much for hydro-electric power as they would have to pay were the power generated by steam, and as a result of the possession of these natural monopolies the millions of dollars of saving that will be effected by utilizing our water powers would go into the pockets of private individuals instead of being distributed amongst the people generally. The only relief that they could ever hope to obtain from such a state of affairs would be to buy back, at enormous prices, franchises which they had parted with practically for nothing.

Don't Export Hydro-Electric Power.

Just here it might be pertinent to point out that, so far as the true interests of the people of Ontario are concerned, not a single horse-power of hydro-electric power should ever have been allowed to be exported from this province to any foreign country. Unfortunately in years gone by, charters were granted to corporations which not only gave them a practical monopoly of power development on the Niagara River and at Fort Frances, but allowed them to sell a large proportion of it for export; so that even with its broader outlook and larger recognition of its responsibilities to the people, the present government on taking office found itself confronted by hydro-electric monopolies and trammelled by agreements for export, which abuses they have only been partially able to remedy by the adoption of a national and public-spirited power policy which has been emphatically endorsed by the people of this province irrespective of party.

The Present Power Situation.

We are to-day confronted with

the fact that at Niagara Falls we have a present export to the United States of 91,000 h.p., and agreements to allow the export of 200,000 h.p. The time is coming, and perhaps it is not so far distant as some people imagine, when we shall need all of this hydro-electric power for our own use. Will we then be able to secure its return without commercial or actual warfare? I am afraid not, and it looks to me as if in this case we had, metaphorically speaking, parted with a large portion of the people's heritage for a mess of pottage.

Before leaving this phase of the subject, it might be pertinent to point out that a great mistake was made by the Ontario government when, in 1887, they granted a charter for the development of power at Niagara Falls. They should have forced its development at Queenston Heights or Jordan, where, on account of the extra fall, practically double the amount of power can be developed from the same amount of water as at Niagara Falls where it is now developed. It is quite possible that in the perhaps distant future, this power policy will be forced upon the people of this province and they will find it not only profitable but necessary, to abandon the present great hydro-electric enterprises at the Falls and locate them where nature evidently intended them to be.

What has been done at Niagara Falls, private monopolists have also been trying to repeat on the St. Lawrence, as well as in Western Ontario. It is true that these attempts have temporarily failed, but our people may rest assured that the United States capitalists who desire possession of these great natural monopolies have not given up the fight, but that they will be heard from again, and that in the near future, although probably in a different way.

Timber in the Hudson Bay District.

The following press bulletin was recently issued by the Forestry Branch:—'An interview with an engineer given recently in a western paper to the effect that there is abundant timber on the line of the Hudson Bay railway is an illustration of the misapprehension in regard to this matter that exists in the public mind. Because there are large areas of land in the north on which there is timber of some kind, the conclusion is reached that it is all of present value and that the country has an unlimited supply. As a matter of fact, a careful inspection of the timber along the line of the Hudson Bay railway made in the years 1910 and 1911 by the Forestry Branch of the Department of the Interior, shows that there is not enough mature timber along the line of that railway to build the road. There are no prairie districts of any extent along the route. There are trees everywhere, but, owing to repeated fires, the forest is, except on the merest fraction of the area, too small for commercial purposes and, unless it can be protected from fire until it reaches maturity, will never be of any use to the country. Explorations in other parts of the northern forested districts tell the same tale. Everywhere fire has worked havoc, and the forest is a mere wreck of what it might have been if fires could be prevented. Unless adequate measures are taken now to protect the young and immature forests, which form the major part of the land, the outlook for the future is none too good.

If the northern forests are to continue to be a permanent source of wealth to the country, it is absolutely necessary that the fire ranging system should be extended and that proper methods of management of the forest should be applied, and public education to the value of the forest is even more necessary.

Sweden, which has large tracts of northern forest, practically uninhabited, similar to those in northern Canada, has about eliminated the fire danger in such districts mainly by educating her people to the value of the forests.'

It is interesting to note that the report of the Director of the Geological Survey in regard to the country along the proposed route of the Hudson Bay Railway, traversed last year by the then Governor General, Earl Grey, and his party, confirms this view of the forests of the region. In addition to the extract from this report given elsewhere in this issue, a further note says:—

'Only the southwestern and southern portions of the district tributary to the bay are likely to furnish timber of economic importance.'

[Courtesy "Sunshine," Montreal.

In the Woods: On the Road to the Dump.

Cost of Forestry in different Countries.

(By H. S. Graves Chief Forester, U. S. Dept. of Agriculture, in the Report of the U. S. National Conservation Commission.)

A comparison of the expenses of forestry in different countries is necessarily unsatisfactory, because the forests differ in character and there is a very wide difference in economic conditions. In Europe systematic forest management was introduced many years ago. The forests are thoroughly organized, and the expenses of administration represent their maintenance, protection, and operation. In this country the work of forest organization has only just been started. Even our National Forests have only been roughly explored, and we have only estimates of the standing timber growing in them and its value. There are almost no roads, only a few satisfactory maps, insufficient demarcation of boundaries, very few fire lines, and the work of construction of headquarters, ranger cabins, telephone lines, etc., remains as yet to be carried out. Almost no working plans have been made for our National Forests, and the life history of the trees must be more completely studied before satisfactory methods of silviculture can be devised. Practically all of the work of organization of the forests remains to be done.

Other conditions enter in also to affect a comparison of expenses. In America and India there is great danger from fire, and large sums of money must be spent on providing

adequate fire protection. In Europe, on the other hand, the danger from fire is very small in most places, largely because of a dense population, an enlightened public sentiment, and an organization of the forests which is the result of many years' work.

Again, the market conditions affect the kind of forestry which can be practiced. With constant good markets, as in Europe, it pays to use more intensive methods of forestry than where only certain classes of timber can be sold. For this reason the Germans can afford to spend on cultural operations proportionally larger sums than the Americans. In the same way the total expenses of forestry in a country are influenced by the methods of timber sales. If timber is sold on the stump the outlay is less than if the government does its own logging. The last system involves a large annual expense for logging which does not appear in the budget of a country which sells its timber standing.

These facts must be borne in mind in the study of the forest budgets of Germany, France, India and the United States, which are discussed in the following pages.

A comparison of expenses in these different countries shows some astonishing differences. Prussia, with its forest of a little over 7,000,000 acres, spends each year about $14,000,000; India, with about 65,000,000 acres (including only reserved and protected forests), spends only about $4,000,000. The United States, with about 168,000,000 acres of national forests, spends only about $3,400,000. If these data are expressed in terms of the amount per acre, it is seen that the expenditure by Prussia is over $1.90 per acre as against that of the United States of about 2 cents per acre. In this connection it must be borne in mind, however, that Prussia did not expend so large a sum on forestry at the beginning of its work of organization. With the development of forestry and the increased demand for timber and the resulting high prices, it has been profitable to use more and more intensive methods and invest greater sums each year in forest cultivation. This is well illustrated in Prussia, which in 1849 spent for regularly recurring expenses about $2,000,000 each year, compared with $12,500,000 at the present time.

In other words, the expense of administration increases with the development of forestry. This is possible only when there are increased returns as a result of the increased initial expenses. This principle is illustrated in Prussia, where the net income has increased from less than $7,000,000 in 1848 to about $14,000,000 at the present time.

To carry out further the comparison of expenditures in the different countries, Prussia spends for salaries, including both administrative and executive forces, 52 cents per acre; France, 38 cents; India, a little over 2 cents; and the United States, a trifle over 1 cent. The average area in charge of a supervising forester in Prussia is about 10,000 acres; in the United States it is over 1,000,000 acres. While our western forests will not require a division into so large a number of administrative units as those of Prussia the contrast is nevertheless exceedingly instructive.

Although the Prussian forests are already thoroughly organized, nevertheless the work of constructing and extending roads and bridges, dams, etc., is being pushed each year with an expense of over $500,000, and that is about the sum which is now being expended on all kinds of construction work in our national forests. In other words, for con-

struction work, including buildings, telephone lines, etc., Prussia spends about 16 cents per acre and the United States about 3.5 mills. In reality the comparison ought to be reversed, for construction work constitutes an exceedingly important part of the first organization of a forest.

The great yield of timber and large returns in money from the European forests are the result of careful, intelligent forestry. Not only are the forests protected, but they are constantly improved; they are properly thinned to obtain the best possible conditions of growth, and open areas are planted with trees when reproduction cannot be secured naturally. All of this involves expenditure of money. Such improvement work costs in Prussia $1,700,000 each year, or 23 cents per acre. Even in India there is an expenditure of over $173,000 a year for cultural operations. The expenditure in the United States is only about $50,000 for this item, a sum so small that it can hardly be expressed in terms of expense per acre.

One of the great problems in the United States is the training of men to handle the work of the national forests. At the present time the number of trained men available for the administration of the forests is entirely inadequate. The country is fortunate in having private schools which are educating men for federal service. The United States Forest Service is aiding these schools to a small extent, but the total amount expended is probably not over $1,000. This may be compared with $50,000 spent in Prussia, $37,000 in France, and $26,000 in India.

It is obvious from this brief comparison of expenses in different countries that the amount of money spent on the administration of the National Forests in this country is exceeding small, and it is perfectly obvious to anyone who knows the conditions that a very much larger amount is required to accomplish the purpose of the people of the United States in managing their government forests.

Expenditures for Forestry in Prussia, France, India, and the United States.

PRUSSIA.

(From the budget of 1908).

Recurring Expenses :	Amount.	Per acre.
Superior staff	$1,433 590.00	$0.19
Subordinate staff	2,468,9 1.00	.33
Rents and expenses of offices	870,085 00	.12
Scientific work and education	96,750.00	.013
Extraction of forest products	3,082,750 00	.42
Cultural work	1,710,500.00	.23
Construction and maintenance of buildings	598,750.00	.08
Construction of roads, dams, etc.	571,500 00	.08
Land purchase	262,500.00	.04
Administration of communal forests	492,000.00	.07
Other expenses	683,914.00	.09
Total	$12,521,250.00	.....
Extraordinary expenses	1,149,450.00	.16
Grand total	$13,670,700.00	.....
Average	.....	1.823

FRANCE.

(From the budget of 1907.)

Recurring expenses:	Amount.	Per acre.
Superior service	$500,000.00	$0.17
Subordinate	614,000.00	.21
Service and expenses	145,400.00	.05
Education	37,200.00	.01
Cultural and protection	243,400.00	.08
Construction work	675,200.00	.23
Exploitation	83,000.00	.02
Hunt	15,200.00	.005
Special taxes	420,000.00	.15
Miscellaneous	52,400.00	.02
Total	$2,876,300.00	
Average		.945

INDIA.

(Expenses for 1907-8.)

Recurring expenses:	Amount.	Per acre.
Superior staff	$774,884 00	$0.012
Exchange compensation allowance	28,083 00	.0004
Subordinate staff (including rangers foresters and guards)	704,218 00	.011
Office establishments (including contingencies)	347,171 00	.005
Extraction	1,478,176 00	.027
Roads and buildings	287,668 00	.004
Fire protection	192,596 00	.003
Cultural operations	172,763 00	.003
Live stock, stores, and plant	169,384 00	.002
Working plans	28,914 00	.0004
Rent for leased forests	285,979 00	.004
Miscellaneous	69,660 00	.001
Expenditure on realization of revenue from forests not managed by the Government	7,121 00	.....
Forest science and education (including all "A" and "B" charges of forest school)	26,656 00	.0004
Extraordinary expenses	179,664 00	.003
Grand total	4,138,691 00	.0762

UNITED STATES.

Expenses for 1907-8.)

Administration (for the general administration of the Forest Service)	$162,703 38	....
Use (for the use, maintenance, and protection of the National Forests)	2,363,394 64	....
Improvements (for the construction, and repair of permanent improvements upon the National Forests)	592,169 19	....
Studies (for studies necessary for the use and protection of the National Forests and of otner forests in the United States, and to promote economy in the use of forest products and the distribution of their results)	297,840 40	....
Total	$3,416,107 61	....

(From photos by J. J. Kelso. Courtesy Commission of Conservation.)

Rural Slums. Does the City Offer Much Worse?

These illustrations depict scenes in a district of Eastern Ontario. They represent graphically the conditions which arise when people are allowed to settle on land not fit for agriculture, and where their unavailing efforts to make a decent living for themselves and their families result in their utter discouragement and surrender to all sorts of vices. It is good to know that the Ontario government has of late become more alive to the dangers of this policy of opening for settlement land which is unfit for that purpose and that hence such scenes as the above are not likely to be duplicated.

The Future of British Columbia Lumbering.

By Judson F. Clark, Ph.D.

British Columbia is still distinctly in the pioneering stage, the stage when the disproportion of natural resources to population intoxicates the mind and holds out opportunities for the capable and energetic which are but dreams and memories in the older provinces and states.

In no department of industry are the opportunities for men with brains and capital, or even with brains without the capital, greater than in the line of forest products.

In the development of the lumber industry in the neighboring state of Washington we see the promise of the future of the industry in British Columbia. In 1880 the value of the product of the lumber industry of Washington was $1,700,000; in 1890, $17,500,000; in 1900, $30,300,000; in 1907, $100,000,000. The value of our forest products will be about $18,000,000, or equal to that of Washington in 1890. In seventeen years (1890-1907) Washington increased her lumber output sixfold and rose from a very minor position as a lumber-producing state to a position at the top of the list as the greatest lumber-producing state in the world, a position of distinction which she has since retained and is likely to retain until displaced by British Columbia about ten years hence.

British Columbia's advance to a pre-eminent position among the lumber and paper producing countries of the world is assured by its forest resources and by the development of its markets and transportation facilities. These same considerations also assure a much more rapid development than was realized in the State of Washington.

Important Commercial Woods.

British Columbia's resources in standing timber, taken in all three aspects of quality, quantity and price, defy competition. As in Washington, the Douglas fir is the most important tree on the southern portion of the coast. It frequently exceeds two hundred and fifty feet in height and reaches fifteen feet in diameter. In general, however, it runs from three to six feet in diameter and cuts from one hundred to two hundred lineal feet of logs. In quality of wood it resembles the southern yellow pine, but, of course, gives much larger dimensions and a much larger proportion of clear lumber.

Next to the fir in importance is the giant arbor-vitae, or red cedar. It reaches a height of about one hundred and seventy feet, and averages three to six feet in diameter, though occasionally much larger. Already it supplies about seventy per cent of the shingles consumed in Canada and the United States.

The spruce, which replaces the Douglas fir on the northern coast, is at least equal to the best spruce elsewhere for pulp purposes, and, on account of its large size, gives a very much larger proportion of clear lumber. The Western hemlock and the balsam fir are trees of great size and beauty, and further excel their eastern cousins, the former by an entire absence of shake and brashiness of grain and the latter by its uniform soundness.

The sixth and only other important tree of the coast forests is the cypress or yellow cedar. It has all the good qualities of the cedars, including great durability and evenness of texture, and possesses, in addition, a degree of strength and elasticity not to be found in any

cedar. It is also a very beautiful wood. Without doubt it is the coming canoe and boat builders' wood of the continent.

Markets and Transportation.

But forests, no matter how magnificent, must await the development of markets and of transportation facilities before a great lumber industry may arise. British Columbia has been waiting in this sense for many centuries, but her day has now come. The lumber consumption of the world is rapidly decimating its resources in standing timber. North America, east of the mountains, is by far the greater lumber market, consuming, in fact, more than all the rest of the world combined. Nor has this enormous demand shown any tendency to decrease with advancing prices; on the contrary, it has more than kept pace with the increase in population, and the latest statistics indicate a per capita consumption in North America of about four hundred cubic feet of wood, including five hundred feet board measure of sawn lumber. On the other hand, the diminishing of the forest resources of Eastern America has reached an acute stage. Three fourths of the remaining forest resources of the continent lie west of the Rockies, while nine tenths of the markets lie to the east.

So much for the vast and growing hunger for wood products in the East and the wonderful forest resources of the West. A word as to transportation developments. Already the products of the British Columbia forests — notwithstanding our limited rail facilities and a freight cost of all the way to $25 per M—reach every important market. With the advent in the near future of the Grand Trunk Pacific, the Canadian Northern and other projected railways, our rail facilities will be at least trebled and perhaps more than quadrupled, while a veritable revolution will be wrought by the completion in 1914 of the Panama canal. The canal will reduce the distance from Vancouver to New York by water from nearly fourteen thousand miles to less than six thousand miles. It will also convert it from a sailing to a steam route, cheap coaling being available, thus reducing the time in transit, which is now from four to seven months, to less than thirty days, with a corresponding cut in interest and a still larger cut in insurance cost. More important still, perhaps, it will enable Eastern builders and other lumber users to have orders for special purposes shipped by water with a much greater certainty of prompt delivery than can be hoped for by rail. Many hope to see the present freight rates of from $12 to $16 per M around Cape Horn cut in half when the canal is opened. A saving of one fourth of the present rates would revolutionize the lumber industry of the British Columbia coast.

Opportunities for Investment.

The opportunities presented by present conditions in the development of the British Columbia lumber industry are such as should interest (1) the large investor who desires a field for investment, giving large returns with small risks; (2) the investor of moderate means who wishes to conduct a business which will give profitable employment for his capital and, at the same time, ample scope for his own activities; and (3) the man of brains and energy who has no financial backing, but who has a lot of capital in the way of confidence in himself and in the country.

For the large investor British Columbia timberlands present at the present time one of the safest and most profitable fields. British Columbia tidewater timberlands are unusually safe in regard to the only serious risk, the fire hazard. This is due to the heavy rainfall, ranging from sixty-four to one hundred and twenty inches annually, and the

almost eternal dampness of the dense forests. The topography, too, presents barriers to the running of fires over large areas. Furthermore, the durability and large size of the Douglas fir and the red cedar, together with the comparative absence of injurious boring-insects on the burned-over lands, make it possible to log these timbers for many years after they have been killed by fire.

The red cedar is especially good in this respect, and is sawn into the finest of lumber and shingles fifty years after being killed by fire. It is bound to be profitable, as for half a century the increasing value of standing timber has made its ownership about the most consistently profitable of all lines of American investment.

Standing timber has been increasing in value for half a century without a set-back. At present the world's supply of timber is being cut some threefold faster than it is being renewed by growth. The stumpage values of the leading timbers of North America east of the mountains have increased from thirty to ninety cents or more per thousand feet board measure per annum during recent years, the average for all softwoods being more than fifty cents per M per annum. What has become history east of the mountains will certainly become fact on the Pacific Coast upon the completion of the Panama canal. This indicates an enormous return for stumpage at $2 per M, but first-class stumpage may still be secured for $1, or even less, a figure which may well be regarded as nominal when the high quality of the timber is considered.

The doubling, trebling and quadrupling of the logging and manufacturing facilities during the coming decade will also offer large scope for the investment of capital. This will be an especially attractive field for far-sighted men who will have earlier secured a suitable reserve of raw material. An earnest of what is to come along these lines is the completion last year of one of the largest sawmills in the world on the Fraser river, and the present building, at a cost of several millions, of a very large and strictly up-to-date paper mill at Powell River.

But the door of opportunity is open not alone to the investor of large means. The British Columbia coast is peculiar in the amazing length of its coast line and the wonderful series of protected inside channels which admit of cheap towage of logs to central points for manufacture. These waterways are bordered with timber tracts, many of which are of small size and therefore available for the men of moderate means who are looking for a start in business. Advantage has been taken of these favorable conditions, and the coast is already dotted with small logging outfits. Opportunity in this direction will be open for some years to come, but all the easy logging opportunities will eventually have been worked, and logging will have passed into hands financially strong enough to build railways and other expensive developments. Another opportunity for the man of limited capital will have come when imminent exhaustion of their own cedar resources will have forced the United States to come to British Columbia for their shingles. If this has not already come before the Panama canal is completed, it will then be assured, and small shingle mills will presently be found dotting the coast, utilizing the vast quantities of cedar now left as waste on the slashings.

But the great future of the lumber industry of British Columbia will assure large opportunities for the man of brains and energy, although without capital other than confidence in himself and the country. The opportunities will range from that of logging camp foreman or sales agent to that of

(Continued on page 163)

Burned-over Country.

Found by Many Geological Survey Explorers in 1910.

The summary report of the Geological Survey for 1910, like so many reports of the Survey already published, gives evidence of the widespread prevalence of forest fires throughout the Dominion. Reporting on the country traversed by the late Governor-General, Earl Grey, and his party, the Director, on page 17, writes:—

'The whole country from Lake Winnipeg to York is timbered, but, as the route followed had been the boat route from York, used for almost a century for a large part of the entire trade of the northwest, the forests have suffered repeatedly from fires, so that practically all is second growth and no sizable timber was seen. Where the original forest is preserved, merchantable sizes may be expected in the upper portion of the district, and pulpwood for some distance down, but, what with forest fires, muskeg and climatic conditions near the bay, it seems unlikely that the timber of that particular district will prove of great value, except for local purposes. Around the southern end of the bay, conditions, of course, are different, and the forest is of greater economic importance. The trees are principally spruce, poplar, and tamarack; canoe birch dsappeared on the lower part of the Hayes.'

Mr. D. B. Dowling, reporting on the Coal Fields of Jasper Park (Alberta), writes as follows:—

'The largest area of green forest, containing timber of marketable size, occupies a triangular stretch of country lying to the east of Brûlé lake. The wagon road to Prairie Creek runs along its southeastern margin. Along the Athabaska burnt country extends from the east to a point nearly half-way between the lake and Prairie creek. Other fairly large areas of unburnt timber are found within the mountains, on the flat lands through which wind the many channels of the Athabaska river. Another area of green forest, consisting of patches only, extends from the head of Drystone and Prairie creeks to the western sources of McLeod river. Although throughout the district there are, here and there, small patches of living trees, the greater part of the original forest has been burnt.'

Mr. W. McInnes reports on his exploration of a tract of country lying north of the Saskatchewan river, in the eastern part of the province of Saskatchewan. The following is an extract from his report (page 171):—

'There are areas still standing of good white spruce, both in the region of the Saskatchewan valley, and in the higher land to the north, though forest fires have denuded much of the region of what valuable timber it once supported. Several tracts of considerable size were burnt over last summer. Could the fires be prevented or checked, large areas would within a measurable period become reforested, since the rate of growth in favourable situations is fairly rapid. Two white spruces growing in Cumberland lake were cut into for the purpose of ascertaining their rates of annual growth. It was found that the added growths for the past three years, deduced from the rings of growth, were three fourths of an inch and half an inch respectively, rates that compare favourably with those of many a much more southerly locality.'

Mr. J. D. Trueman writes of the Gunflint district, Ontario, his work having comprised the exploration of the country around Gunflint and Saganaga lakes (situated on the International boundary some seventy-five miles west of Port Arthur and Fort William). Treating of the timber, he reports (p. 184) as follows:—

'Owing to its rocky character, the value of much of the country near Gunflint lake as a national resource must lie entirely in its mineral and forest wealth. Over considerable areas valuable timber is still standing, the principal varieties of trees being red pine, jack pine, spruce, balsam and tamarack. White pine occurs, but is not common. Birch and poplar are quite abundant.

'Forest fires during the summer season of 1910 proved unusually destructive over a large section of country west of Lake Superior. A long period of dry weather made conditions very favourable for the spread of fires, so that during the latter half of June and the earlier part of July a dense cloud of smoke remained almost continually in the air.'

[Courtesy "Sunshine," Montreal.

In the Woods: Ten Minutes for Refreshments.

1910 Forest Statistics of Canada.—II.

The total number of cross-ties purchased in Canada in 1910 was 9,213,962, and these cost $3,535,628. Compared with the purchases of cross-ties in 1909 there is a decrease of 4,964,279 (35 per cent). Cedar furnished forty per cent of all the ties used, jack pine 23.5 per cent, and hemlock 13.8 per cent, these three species thus supplying 77 per cent of all the ties. Douglas fir furnished 9.6 per cent of all the ties and tamarack 7.1 per cent, the five species mentioned thus making up ninety-four per cent of the total number. Other species used were oak, spruce, cypress, chestnut and white pine. About seventy per cent of all the ties purchased in 1910 were hewn and thirty per cent sawn. Of the oak ties ninety-five per cent were sawn, but of the other species the great majority were hewn. The average cost of all ties was thirty eight cents; sawn ties on the average cost thirty six cents, hewn ties thirty nine cents. These values range from seventy four cents for a sawn oak tie to twenty three cents for a white pine sawn tie.

Steam railways used ninety six per cent of all the ties used. The total number used by them was 8,909,422, at a total cost of $3,412,227, and an average cost apiece of thirty eight cents. The electric railways used only four per cent of all the ties purchased during the year specified. The total number used was 302,540, at a total cost of $123,401, and an average cost per tie of forty one cents; almost fifty per cent of these were cedar, the next wood in point of number being Douglas fir which furnished thirty two per cent of the total.

A small number of cypress ties were imported by both steam and electric railways. The average cost of ties used by the electric roads decreased six cents in 1909. With the electric railways 61.4 per cent of the ties purchased were hewn. Of the sawn ties fifty per cent were Douglas fir and thirty four per cent were cedar, in the case of hewn ties fifty seven per cent were cedar and 20.7 per cent Douglas fir. The species which are chiefly used sawn are cedar, Douglas fir and oak; the species chiefly used hewn are hemlock, tamarack, cypress, spruce and jack pine. Progress has now been made in the chemical treatment of railway ties in Canada.

Mining Timber.

Reports were received from one hundred and thirty six coal and ore mines in the various provinces. Of these, fifty nine were in British Columbia, twenty seven in Ontario, twenty in Alberta, fifteen in Nova Scotia, nine in the Yukon Territory, four in Saskatchewan, and two in Manitoba. A great many Canadian mines do not use timber in their operations.

The mining timber has been divided into two main classes, viz., round timbers and sawn timbers. The round timbers are those used underground to give artificial support for roofs or walls, and to protect shafts, drifts and gangways. The sawn timber reported is mostly lumber, together with a small quantity of square timber, and is used principally for breakers, tipples, washers, trestles, and mining buildings generally.

The total value of the timber used in the mines was $827,337, composed of 52,848,000 linear feet of round timber worth $523,339, and 22,305,000 board feet of sawn timber costing $303,998.

Three provinces of Canada consumed 98.6 per cent of the timber used in mining; these provinces are British Columbia, which used fifty five per cent (29,047,000 linear feet), Nova Scotia, which used thirty per cent (15,653,000 linear feet) and Alberta, which used fourteen per cent (7,484,000 linear feet). The average cost per thousand linear feet ranges from $37.90 in the Yukon Territory to $7.01 in British Columbia. The mines of Nova Scotia pay on the average $10.74 per thousand linear feet, and those of Alberta $17.75.

Of the twelve species of wood used, 53.8 per cent was Douglas fir, the total quantity used being 28,268,000 linear feet, at a cost of $198,776. Over a quarter of the wood (27.5 per cent) is spruce, the quantity consumed being 14,417,000 linear feet and the cost $179,734. Of jack pine, the third species in importance, 4,455,000 linear feet were used, costing $66,751; this includes both the eastern jack pine and the lodgepole pine.

These three species furnished ninety per cent of the round timber used. Other species used were balsam fir, hemlock, tamarack, pine, birch, poplar, cedar, maple and beech.

The largest part of the round mining timber used ranged from five to nine inches in diameter. Thirty one million, nine hundred and sixty seven thousand (31,967,000) linear feet of the total of 52,848,000 feet falls into this class. The average cost of timber of this size was $12.63 per thousand linear feet. Over one third of the total consumption (19,046,000 feet) was less than five inches in diameter and cost but $2.66 per thousand linear feet. The timber under five inches in diameter was practically all Douglas fir used by the large coal companies of British Columbia.

Of sawn timber 22,305,000 board feet were used, the total value of which was $303,998, an average value of $13.63 per thousand. Of the total amount, British Columbia used over fifty per cent, Alberta twenty five, and Nova Scotia fifteen per cent. Douglas fir constituted over one half (56 per cent) of the total quantity used, spruce almost twenty one per cent, and tamarack 8.6 per cent, the three woods together forming over eighty six per cent of the total quantity.

Poles.

The total number of poles purchased in Canada during 1910 was 782,841, the increase over the number reported for 1909 being 434,586 (118 per cent). The total value at the point of purchase was $1,043,874, an increase of $546,882 over the value in 1909. The average cost of poles was $1.39 in 1909 and $1.33 in 1910.

Cedar poles form over ninety nine per cent of the total; it is practically the only Canadian wood growing to a convenient pole size which is cheap, easily handled and durable. A few chestnut poles were reported from the United States.

Seventy five per cent of the total number of poles used are from twenty to twenty five feet in length. Th cheapest poles are chestnut, with cedar a close second.

In 1910, reports were obtained from five hundred and fifty nine companies, almost ninety per cent of the total number operating; of these two hundred and ninety one were electric light and power companies, one hundred and sixty one telegraph companies, sixty two steam railway companies, forty one electric railway companies and four telephone companies. Two hundred and eighty three operated in Ontario, ninety-four in Quebec, thirty nine in Nova Scotia, thirty five in Saskatchewan, twenty seven in Alberta, twenty three in New Brunswick, twenty three in British Columbia, seventeen in Manitoba, and ten in Prince Edward Island; eight were United States companies operating in Canada.

Interesting tables are given comparing the prices of cedar and spruce poles in Canada and the United States in the year 1909. These show that up to thirty feet cedar poles are more expensive in Canada than in the United States; above that length they become cheaper. As seventy five per cent of the poles used in Canada, however, are thirty feet or less in length, the Canadian companies pay more for them than do United States companies. Spruce poles, on the other hand, are cheaper in Canada than the United States up to twenty-five feet in length, but poles of greater length than this are more expensive.

Cooperage.

Reports as to cooperage production in Canada in 1910 were received from one hundred and thirty three firms, of which one

hundred and twenty six were in operation. The value of the products of this industry has decreased one hundred thousand dollars during 1910, owing to a great decrease in the price of slack cooperage.

The total value of the products of the cooperage industry in Canada for the year was $1,740,709. Slack cooperage comprised $1,395,545 of this, which was $200,000 less than in 1909. The value of the tight cooperage was $345,164, an increase of $100,000 over the 1909 value. There were, however, five hundred thousand pieces more of slack cooperage produced in 1910 than in 1909, the total number of pieces of slack cooperage turned out in 1910 being 152,925,000. In tight cooperage 8,716,000 pieces were used; this is 780,000 pieces less than in 1909. The increase in value of tight-cooperage stock is probably due largely to fuller reports rather than to a greater demand or growth in the trade.

In quantity, slack cooperage forms 94.6 per cent of the total and in value forms four fifths.

In slack cooperage, elm, spruce, poplar, and basswood are by far the most important woods of the fourteen kinds of woods used. The total of the manufacture of slack cooperage for the year was as follows:—104,821,000 slack staves valued at $736,960; 9,860,000 sets of slack heading valued at $330,480, and 38,244,000 hoops valued at $328,105.

Elm continues to be by far the most important wood, but spruce is slowly becoming more important as a stave wood. These two species supply over four fifths of the entire stock. Balsam fir seems to be coming into greater favor, this species, as well as poplar and ash, being used to a much greater extent than in 1909.

In all items the average value of slack cooperage shows a decrease in 1910. Elm is the most expensive wood employed in large quantities, being worth $7.78 per thousand. Basswood is next at $7.37, and balsam fir cheapest at $4.26. For headings basswood constituted almost half of the wood used. Poplar and spruce are the cheapest woods used. Prices for heading in 1910 fell off considerably, the average value of $33.53 being $18.50 less than the price in 1909.

For hoops over twenty times as much elm was used as of any other woods. Over one million hoops each of spruce and poplar were also used. Hoops also show a decrease in price for 1910, having fallen off $1.29 per thousand. The most expensive hoops are those of basswood at $9.86; elm hoops cost $8.78 per thousand, spruce only $5.38, ash, birch and maple about $9.10.

Details of tight cooperage manufacture for 1910 were as follows:—8,379,000 staves worth $272,924, and 337,000 sets of heading, valued at $72,240.

The chief wood used in this industry is oak, which is imported from the United States, either as staves or in the log. Twelve species altogether are used in the manufacture of tight staves, spruce, gum, ash, basswood and birch being used next to oak. The number of sawed staves reported in 1910 was twelve hundred thousand less than that reported in 1909. The total value of sawed tight-cooperage for 1910 was $53,590 more than in 1909. Of the total number of staves, 7,137,000 (85.1 per cent) were sawed staves, 923,000 (11 per cent) were ale and beer staves and 319,000 were bucked and split staves. The quantity of ale and beer stock reported in 1910 was seven times the amount reported in 1909. For the last two classes of staves, only fine-grained white oak can be used, and, as the white oak supply is rapidly decreasing, the production of these staves is falling off.

Of tight heading 337,000 sets were made having a total value of $72,240 and an average value per set of twenty one cents. Of the tight heading manufactured ni Canada in 1910, eighty six per cent was sawed, and fourteen per cent was ale and beer. Oak was used in the manufacture of three quarters of the sawed heading, and cost on the average twenty five cents per set. Spruce, Douglas fir, ash and basswood were also used, ranging in price from seven cents for ash and basswood to eleven cents for Douglas fir.

THE FUTURE OF BRITISH COLUMBIA LUMBERING — *Continued.*

manager of large enterprises. A field which has as yet hardly opened, but which must in future grow large and ever larger, is that of forest engineering. Undoubtedly the time is at hand when the Provincial Government will employ technically trained men to look after the public forest interests. Private owners and operators will follow suit just as soon as they see that it is profitable to do so. Without doubt the course of events will follow closely the story of developments in the United States, where serious inroads have been made in the staff of the United States Forest Service by the lumbermen east, south, and west, who are willing to pay more liberally and advance more rapidly capable forest engineers than is practicable in the government service.

Forestry and the Lumber Business.

By J. E. Rhodes, Secretary Weyerhaeuser Lumber Co.

[The writer of this article is associated with one of the greatest lumber concerns in the United States. While portions of the artcle refer especially to conditions in that great republic, these contain a moral for Canadians also, and the greater part of the article applies to conditions in both countries.—*Ed.*]

Forestry in its larger sense means the preservation of the forests for use. Using the forests involves lumbering; therefore forestry and lumbering must eventually become one consideration. Forestry which does not contemplate the use of the forest is not practical forestry and will not appeal to practical men. It is, therefore, necessary that the forester should know something of the conditions and necessities of the lumber business.

While I do not speak with authority, I am more or less familiar with the views which are held by many of the progressive men of the lumber industry upon the subject of forestry. It is not strange that the generation of lumbermen now passing had but little patience with the theoretical forester. The evolution of economic conditions is only just now beginning to make possible the consideration of the application of scientific forestry principles to lumbering operations with any hope of financial gain. While it is true that forestry methods are adaptable to lumbering in a small way in certain localities and in certain species of timber, it is impossible to apply them to the large lumbering operations in the Lake States, in the Southern States, and in the States of the Pacific Coast.

Development of Lumber Business.

The lumber business has gone through several stages of development. Like everything else, it has proceeded along the easiest and most natural lines. Up to 1897 it was not considered more profitable than the majority of manufacturing industries —indeed, not as profitable as the average. Up to that time the views of our fathers still prevailed to the effect that the forests should be cut as rapidly as possible in order that the land might be opened for settlement.

With the prosperity and expansion of the nation, which began in 1898, the consumption of lumber increased beyond all precedent, and continued in a large way up to the close of 1907, when it was checked by the panic. During the ten years from 1898 to 1907 the abnormal demand for lumber was at times beyond the ability of the mills to supply. This resulted in the development of new fields of timber in the South and West, gave a value to many kinds of timber which had been previously considered almost worthless, and stimulated the building of many new mills. This exploitation and development of the lumber industry did not cease until the producing capacity far exceeded all reasonably possible demands for lumber.

With the increased wealth of the people the demand for lumber increased per capita. From 1900 to 1908 the increase in population was estimated at 22 per cent., while the increase in the consumption of lumber was 65 per cent. The consumption of lumber per capita has been figured as 360 feet in 1890; in 1900 it was 460 feet, and, on the basis of the census of 1910, it was practically 500 feet.

The Advance in Stumpage.

Answering to the law of supply and demand, the price of lumber advanced considerably during the period between 1898 and 1907. It was during these years that the public generally first came to realize that the timber resources of this nation are not inexhaustible. This realization marked the second stage in the development of the lumber industry in this country. Together with the extraordinary demand for lumber, it caused the value of standing timber to advance sharply. In 1890, Northern pine stumpage (the estimates of which included only the very best white pine) was sold for from 75 cents to $4.00 per thousand feet, depending upon its location and character. To-day it sells from $6.00 to $14.00 per thousand feet, and the estimates cover everything on the land, including white and Norway pine, tamarack, spruce, balsam, fir, jack pine and anything that will make a sawlog. Yellow pine timber in the Southern States was considered of very little value and twenty five years ago sold for 50 cents to $1.00 per thousand feet. To-day the production of yellow pine constitutes nearly one half the total lumber output of the United States, including the hardwoods. Yellow pine stumpage has risen from practically nothing to from $3.00 to $5.00 per thousand feet.

In 1890, the total production of lumber in the Lake States was over nine billion feet, while in 1910 it was only about two billion. More than five hundred mills which were at one time or another sawing northern pine in Minnesota, Wisconsin and

Michigan, are no longer operated, because there are no more logs to saw. While the output has declined in the Lake States, it has rapidly increased, because of the building of new mills, in the South and West, so that the aggregate production of the country has been growing. The census reports show the following lumber production of the United States in recent years:

1904	.....	34,135,139,000 feet.
1906	.....	37,550,736,000 "
1907	.....	40,256,154,000 "
1908	.....	33,224,369,000 "
1909	.....	44,585,000,000 "

The Panic of 1907.

The decline in the production during 1908 was due to the financial depression following the money stringency of the last quarter of 1907. The entire lumber industry has been marking time since that panic. It is one of the very few businesses which have not fully recovered from the effects of the decline in prices suffered at that time. But it is significant that while the prices of lumber declined, the prices of standing timber did not. Partly as a consequence of the completion of new mills under way, the total production of lumber in 1909 was the largest in the history of the nation.

Conservative Lumbering.

There is every reason to believe that the lumber production of the country has about reached its maximum. If generally favorable business conditions are to continue for a few years, it is evident that, with the decline in the output, the lumber business will soon enter upon the third stage of its development, namely, the adoption of conservative methods of handling timber. It is, therefore, easy to see why lumbermen are coming to realize that something must be done if their business is to be prolonged indefinitely. As long as the prices of lumber have barely covered cost of production, as has been the case with the great majority of manufacturers since 1907, no thought whatever can be given to forestry methods. Lumbermen know that timber products are indispensable to our civilization and that they can continue to be manufactured and consumed in the present volume but a few years at best.

When in the course of natural events prices of stumpage have risen to the proper basis, other conditions being favorable, scientific forestry will surely be adopted by lumbermen. They are too intelligent business men not to undertake those methods which will perpetuate their supplies of raw material and prolong their business. If forestry cannot be undertaken with profitable results it cannot be considered at all by private individuals, as they cannot be expected to conduct a work of this kind at a loss to themselves, no matter how much they may be prompted by sentiment or regard for future generations. The price of lumber must reach a point where it will pay to grow trees or forestry cannot be thought of. The time when forestry can be seriously considered as a business proposition, therefore, depends entirely upon the development of economic conditions. It is to help them hasten these conditions that lumbermen will appeal to the foresters. Hence, the interests of the lumbermen and the foresters in working to this end are mutual.

First Steps in Forest Management.

Aside from the present inadequate value of stumpage, the two great obstacles to forestry are, as you know, fire and taxation. When these problems are solved, the field for forestry will be open in America. If the professional forester is looking toward a vocation in economic forestry, outside of the Government service, he must first address himself to the task of subduing forest fires.

A field which promises some opportunities for trained foresters in the immediate future is in the service of the States. A number of the State Legislatures are at this time considering the establishment of State forestry work which will require the services of technically trained men. This work will be confined very largely at first to fire prevention, particularly in the Lake and far Western States. These states themselves own vast areas of timber, for which improved protection from fires will be demanded as it increases in value.

The first concern of the State foresters will be the organization of efficient patrol systems, with all that that involves, namely, securing the co-operation of private timber owners, educating the public by word and pen with regard to its interest in the forest—the fact that forest wealth is community wealth—impressing every citizen with the fact that every tree which burns is a direct loss to him. The work of creating a healthy public sentiment in favor of larger State legislative appropriations for the protection and management of forests will devolve upon the foresters. The enormous losses by forest fires in the past year have put the public mind in a more favorable attitude for advanced work along this line than it has ever been before. It has become recognized that the State should not only insure its own property from loss, but that it owes its citizens the protection of their lives and property as well. No one can do more to impress this fact upon people than the foresters, because when the timber owner announces any such propaganda his motives are immediately questioned. The people will recognize the forester as a man qualified to speak and speak unselfishly.

After they have reduced forest fire losses to the minimum, the next stage of the State foresters will be the inauguration of conservation methods in the handling of State timber, just as the Federal Forest Service has done. This will also include reforestation, which only the state and the nation alone can afford to undertake. State foresters will also be called upon to assist in the classification of lands suitable for the growing of trees as distinguished from agricultural lands. People are beginning to realize that it is a crime to put deluded settlers upon lands from which they reap misery and starvation instead of wealth and happiness. Hence, there will be a field for the professional forester in State work before there is an opening for him in private undertakings.

The Forest Taxation Problem.

Some timber owners are beginning to ask if it is not possible to put the forest upon a permanently paying basis by utilizing its productive power. In endeavoring to figure out what must be done in order that timber may be handled upon scientific forestry principles, lumbermen are confronted with the fact that the present system of taxation is an absolute barrier against the adoption of any forestry methods whatever. And here I will make a distinction between reforestation and conservative lumbering. Lumbermen believe that cut-over lands and lands not suitable for agriculture must be planted, if at all, by the State and National Governments. It is a work which cannot be considered by the present generation of business men as a profitable enterprise or investment, simply because in most species of timber the returns to be expected are inadequate and wholly problematical. The length of time required to plant and mature a crop of trees is too great to interest Americans. The State lives on, while individuals perish. The State can borrow money at two per cent., while the individual must pay five or six per cent., and while the individual must pay taxes in some form or other, the State is exempt. The actual planting of trees, therefore, is for the benefit of future generations, and must be done by the State.

Conservative logging, as lumbermen understand it, means the cutting of virgin timber so that the forest may perpetuate itself. This may involve the cutting of trees of certain species by diameter limit, the leaving of seed trees, leaving stands of young trees where under certain conditions their increase in size will be an element worth reckoning, the protection of watersheds, the cutting of timber for the creation of fire lines, ascertaining the rate of growth of different species in different localities, knowledge of the exact relation between the forest growth and timber consumption, etc. All these will have to be worked out by the technical forester. These conditions vary in every locality and with every kind of timber and with the changing conditions of the lumber market.

In consulting the forester about conservative methods of logging, lumbermen find that the cost will be very greatly enhanced over present costs, and they are confronted with the question of what kind of tax they can pay and still leave a reasonable margin for the investment and risk. Scientific forestry must present some inducement as a business investment or it never will be undertaken. It is useless to expect men to look at it in any other light. It is evident that there will have to be a radical change in the present methods of taxation, and here again the public must be educated by the forester. He alone can show the people that there can be no real progress toward conservation so long as the present system of taxation remains in vogue. It is the most important question before the lumbermen to-day and will some day be one of the most important before the nation.

While many thinking people recognize the truth of this statement, it is to be regretted that up to this time the public generally has opposed any change in present methods of taxing timber lands. If the enthusiastic conservationists expect lumbermen to preserve their trees they must meet them on their own ground and show more of a spirit of harmonious co-operation than has so far been manifested. It is plainly to the interest of the foresters to show the people that so long as the forests continue to be taxed on the basis of an annual crop, holding young trees until they reach maturity means financial loss to anyone who attempts it. Such methods of taxation are in the end ruinous to the community also, for they encourage devastation and abandonment to the State of lands that thereafter yield no revenue either in the form of products or taxes.

At the present time the important matter of the taxes to be levied against timber lands rests entirely in the hands of the local assessors, whose only ambition seems to be to get the largest amount of money they can collect from the owners of timber in their counties. They hold that the more taxes lumbermen are required to pay the faster they will cut their timber, hence, the larger operations they will conduct, the more men they will employ, and the more quickly will the country be opened for settlement.

Timber is now taxed under the general property tax system, the same as most other forms of wealth. Assessments are usually made by men having no special qualification for the work. In some localities efforts are made to cruise or estimate the timber, but knowledge as to the amount and value of timber on certain pieces of land is generally gained from second-hand evidence or by very superficial examination of

the property. The increase in the values of forest lands for the purpose of taxation has been from four to five hundred per cent in many sections within the past few years. The rate of taxation varies according to the township or county in which the timber is situated, and widely different assessments are made by different tax assessors residing in the same towns so that there is no uniformity in either the rate or valuation. There is nowhere in the United States any uniformity for levying assessments on timber or cut-over lands.

The results of such haphazard methods are frequently surprising. It is utterly impossible to make anything like a definite statement in regard to these matters because of the great variation in assessments and rates upon the timber in the same localities and of apparently the same value. The system of taxing timber as other property is taxed was long ago abandoned by every other progressive nation. To ascertain what the actual burden of taxation on timber lands in this country is today will require an exhaustive study covering a long period of time.

I do not know that excessive taxation has as yet prevented the adoption of forestry methods by lumbermen, for the reason that other conditions have not been propitious. The price of stumpage has not yet reached that point where such methods can be applied even if there were no taxes. It is significant that in the localities and species where timber prices are the highest taxes have correspondingly risen. This is true in the white pine of the Northern States where the taxes are much higher than upon timber in other sections. Conservative methods might be undertaken in logging white pine if there were no annual taxes, were it not for the fact that physical and climatic conditions are far more favorable for securing natural reproduction in yellow pine of the Southern States, and in the fir of the Pacific Coast States. This is, of course, due to the more rapid growth of the latter two species. I believe that the pine forests of the North will have to be sacrificed before Southern and Western timber has reached a value which will make it possible to log it in a way to secure successive crops. All but a remnant of the northern forests will be gone under present conditions inside of fifteen years. I do not believe that the Northern States will present a field for the activities of the forester, except in State and Federal service, to be compared with the opportunities in the Southern and Western States. Private forestry will offer very little inducement to the owners of Southern and Western timber inside of ten to fifteen years, and it never will be much of an inducement until the tax is made to follow the saw.

A tax upon the timber crop when it is cut would make it unnecessary for the owner to put up additional capital to sustain his property as is necessary under the increasing annual tax. A tax on the yield would make it an object for the timber owner to hold his property for future speculative values as it would entirely eliminate the principal element now entering into the carrying charge when considering what the final cost may be of holding a tract of timber. The problem of how best to tax timber wealth in such a way as to encourage forestry, while at the same time making it bear its just burden of the expense of government, is one in which the foresters can very properly interest themselves.

Private Work.

The question now arises in your minds as to what there is for the forester to do until that time when conditions are favorable for the adoption of private forestry upon a large scale. The foresters who are looking to the immediate future need not despair, although I am free to confess that the opportunities outside of State and National work are not as promising as many have doubtless been led to believe. The foresters will find a limited field with the operators who take contracts to cut timber off Government land which require more or less forestry regulations. In a short time, the States will demand the same requirements of those who log timber upon State lands. If the young foresters desire to spend a few years in living in the woods, a limited number of men can even now find employment as timber cruisers. As stumpage increases in value, the old-fashioned haphazard methods of estimating timber are found to be unsatisfactory. Lumbermen, especially those operating in white pine, have found that trained foresters can estimate the amount of timber on a given tract of land much more closely than can the old-fashioned cruiser. A trained forester consumes considerably more time in estimating timber than does the old time woodsman because he calipers trees, but his increased accuracy is worth far more than the difference in cost. The forester who seeks employment with lumber companies must be skilled in work of this kind, and the time is not far away when those dealing in timber lands will require that the estimates of standing timber be made in a careful and scientific manner, to include accurate map work and detailed reports of topography, species and the general physical conditions of the country covered. This work requires men of good physique who are willing to live in the woods for months at a time. It is about the only branch of the lumber industry, as it is at present conducted, in which the scientific knowledge of the forester can be especially serviceable. There are other departments of the business in which the forester can engage, but they will only make a partial demand for his knowledge of forestry.

There are but a very few lumbering operations of any size in this country today, outside of New England, where trees are logged with an idea of obtaining a second crop. In some regions a greater precaution is taken to prevent fires than in others, which, of course, gives natural reproduction a chance.

Summary.

The history of European forestry is repeating itself in the United States. We are progressing along exactly similar lines. The price of standing timber abroad averages about as much as the price of manufactured lumber in this country at the point of production, and long before stumpage here has reached a valuation equal to that in Europe, our forests will be protected, conserved and most carefully managed. As soon as there is a sane system of taxation of timber lands, and adequate protection from fire, we shall begin to practice forestry more extensively. It will accompany and be in proportion to the increase in the value of timber. For this reason there will be no timber famine in America.

In seeking to solve the question of fire risks and taxation, the foresters will not only hasten the day when their own services will be in demand but they will be at the same time performing a service of benefit to mankind.

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(Continued from page 142.)

Ottawa Attractions.

The Canadian Capital has many attractions in February. Parliament is in session and all business, manufacturing and social activities are in full swing. Winter sports, including hockey, snowshoeing, skating, skiing and curling are at their height. The Mint, Archives, Museums and Experimental Farm are open to visitors. The Canadian Lumbermen's Association meets on February 6th, and the Canadian Seed Growers' Association on February 8th and 9th.

Hotel Accommodation.

In order to give visitors to Ottawa who are not acquainted with the city assistance in regard to accommodation, the names of several of the leading hotels with their rates are given below. Accommodation may be secured by writing or wiring in advance.

The New Russell, European Plan, $1 to $2; with bath, $2.50 to $3.50.

The Grand Union, American Plan, $2 to $2.50; with bath, $3.

The Windsor, American Plan, $2 to $2.50; with bath, $3.

Hotel Cecil, American Plan, $2 to $2.50; with bath, $3 .

Alexandra Hotel, American Plan, $2 to $3; with bath, $3.

Further information concerning any details of the Convention will be gladly furnished by the Secretary, Canadian Forestry Association, Ottawa, Canada.

The largest quantity of square white pine timber ever exported from Canada in any one year was that exported in 1868, when 37,954,788 cubic feet were exported, valued at $2,467,629.

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The title page and table of contents to Vol. VII. (1911) have been printed and may be obtained on application to The Editor, Canadian Forestry Journal, Canadian Building, Ottawa.

To the Secretary, Canadian Forestry Association,
Canadian Building, Ottawa, Ont.;

I hereby suggest the names of the following persons as likely to become members of the Canadian Forestry Association:

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